GLEANINGS IN BEE CULTURE

A JOURNAL DEVOTED TO BEES AND HONEY AND HOME INTERESTS

ILLUSTRATED SEMI-MONTHLY

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STRAY STRAWS

FROM DR. C. C. MILLER.

THE YELLOW COLOR of beeswax is due to the pollen consumed by the bees.

TO PREVENT BREAKING combs in extractor, F. Trebnitz, in *Centralblatt*, recommends to extract from one side before uncapping the other.

I HELD A QUEEN-CELL in my fingers while the inclosed queen was quahking. You would be surprised to know how strongly it jarred my fingers.

WAS THERE EVER any one thing so earnestly sought after by bee-keepers as some plan to prevent swarming? Surely, out of all the studying and experimenting, something of value will result.

WHITE is justly considered the best color for hives, providing they are painted; but a French writer thinks it is more agreeable to the bees if the part about the entrance be painted some color from yellow to brown.

RED CLOVER is becoming unprofitable for farmers on account of an insect-pest, and Hutchinson says the acreage of alsike in his part of Michigan is on the increase as a consequence. Nice thing for bee-keepers.

COMPLAINT IS MADE by U. Beaudoux, in *Progres Apicole*, that foundation is made with more cells to the square inch than natural comb contains, resulting in rearing inferior workers. Possibly the matter needs consideration in this country.

I MADE NUCLEI one day—perhaps a dozen—using bees that had been queenless a day, and gave a pulled queen to each nucleus. Every queen was killed. If the bees had been queenless twice as long, I think all would have been well.

I MEASURED some comb built by the bees of a queen I got from Dr. Murdock, and found there were 33 cells to 7 inches, instead of the orthodox 35. Then I measured some built by common bees, and was surprised to find these latter still larger.

NEW THINGS I'm always a little shy of till I have thoroughly tried them, or, rather, till the bees have tried them; but I did have pretty strong faith in the Langdon non-swarmer. I'm sorry to say it doesn't seem to work "in my locality."

A KEENER DISAPPOINTMENT doesn't often come to me in bee-keeping matters than to find that queen-excluders do not exclude. I'm somewhat skeptical as to whether perforations can be made small enough to prevent the passage of queens without being too great a hindrance to workers.

HUTCHINSON is "redhot" on the subject of State experiment apiaries. It's a good subject to be redhot about, and he's going to make it the special topic for the August number. He has a capital leader on the topic in the July number.

MY BEES seem worse than usual this year about uniting and going back to the wrong hive when they swarm without a queen. I don't like having the supers of one hive deserted in that way while another hive has bees piled all over it.

QUEEN-EXCLUDERS are made with wood slats, and also of an entire sheet of perforated zinc, wood-bound. I am told that ten of the latter are used to one of the former. Why? They are a trifle cheaper, but the slatted ones keep their shape ever so much better.

DOOLITTLE makes a paddle of peculiar construction with which to kill bees that persist in chasing and scolding. A very good substitute for this is a piece of very heavy wire cloth. It will fetch the bee every whack, while a stick will miss nine times out of ten.

I DON'T OFTEN give a young queen a chance to do so, but the other day a queen flew away just as soon as it came out of its cell. Flew strong too. But that's nothing new; for when half a dozen queens come out with an after-swarm, all but one of them must have just hatched.

DEAD BEES to a considerable number are often seen in front of a hive to which a queen has been introduced, their curled-up position showing that they have been stung to death. I think this is an indication that the queen will be received all right. The bees which make an attempt on the queen's life are stung to death.

FIVE CELLS to the inch is commonly understood to be the correct measurement of worker comb. As a result of 36 measurements, Cowan found great diversity, ranging from 4.74 to 5.38 to the inch. Some that I measured showed larger cells than his largest, being 4.66 cells to the inch—the work of a black swarm that came to me.

HERR REEPEN, in *Centralblatt*, gives the word "bee" in different languages, as follows: Latin, *apis;* Italian, *ape* or *pecchia;* Spanish, *abeja;* French, *abeille;* German, *biene* or *imme;* Swedish, *bi;* Dutch, *bij;* Polish, *pszczolla;* Russian, *p'cha-lah*; Greek, *melissa;* Danish, *bi;* Arabian, *nahli;* Malay, *burong mata.* Wouldn't it be handier if they'd all call it "bee"?

M. Geremie, in *Le Progres Apicole*, gives an account of experiments which he thinks proves that the industry of a colony depends on the queen. He had an industrious and a lazy colony. He changed queens, and within a week the two colonies changed character. So the mere presence of the queen changed the behavior of the bees.

Your guesswork, as you call it, on page 575, friend Root, may overestimate, possibly. You take the output of sections for 1892, and then say the average should be larger, as 1892 was a poor year. To be sure, it was a poor year; but the output of sections did not measure the crop. for sections were made and ordered, in the main, before any one knew any thing as to the crop. Were not millions of those sections left over till this year?

I don't know for certain, but I think that a pulled queen that is so young that it hasn't yet got its full color is received more readily than one that has become more mature. I suppose they are sometimes imprisoned in the cell by the bees two or three days, so that a pulled queen may not be so very young. If your queen has some age, then the bees to receive her must be longer queenless, while a very green queen will be accepted, for a time at least, in a colony having a laying queen.

CUTTING QUEEN-CELLS.

CELL-CUTTING, IF THOROUGHLY DONE, A SURE PREVENTIVE OF AFTER-SWARMING, ACCORDING TO DOOLITTLE.

In "Stray Straws" for July 1 I find these words: "Cutting queen-cells, it is certain, can not be relied on as a preventive of swarming; but it is equally certain that the practice has a tendency to delay and in some cases entirely prevent it." I should like to ask the doctor what is meant by "swarming," as used by him in this straw. If he means the kind of swarming that we sometimes have in early spring, then I would say that it "can not be relied upon," for in such swarming the bees never prepare or leave any queen-cells, hence there are none to cut. Of all the swarming that ever comes to any apiary, this swarming of discontent, often carried on to the extent of one-fourth to one-half of the whole apiary, is the most disastrous and hardest to overcome of any swarming the bees ever do. With no queen-cells to cut, and no way of successfully stopping such swarming that I know of, the bee-keeper is nearly or quite helpless in the matter. Next, if Dr. M. meant after-swarms, of which nature gives more in number than of all other swarms put together, then I should like to ask him when he found out that the cutting of queen-cells could "not be relied on" to prevent it. I am well aware that the way queen-cells are generally cut "has a tendency to delay" after-swarms, and it also has a tendency not only to delay but to increase the number which will issue. The usual plan is to wait six days after the first or prime swarm issues, when the hive is to be opened, and all of the queen-cells excepting one cut off, when it is claimed no more swarms will issue. After trying this plan for several years I found it worked just exactly as a bee-keeper told me a few days ago it did with him this year. He said he had usually hived these after-swarms in boxes about the parent colony till the old colony had stopped swarming, when he dumped all together in the old hive, letting the young queens fight it out, when they would go on and work well; and if at a suitable time in the honey harvest when this was done, such colonies would do good business, giving a surplus of honey. While he was thus doing, another bee-keeper came along and told him that, if he would cut all the queen-cells but one on the sixth day he would have no more trouble hiving after-swarms in boxes about the parent colony. Offering to show him how, they opened a hive which had swarmed six days before, and bee-keeper No. 2 cut all the cells but one. At the usual time no swarm issued, and bee-keeper No. 1 thought he had learned something of value; but when the 16th, 17th, and 18th days arrived after the issue of the prime swarm, he found he had more swarms from hives thus treated than from those not touched at all. He said that the bees built queen-cells over the larvæ still left in the hive, that was of an age at which it could be converted into a queen; destroyed the cell or the queen from it after she had hatched, which was left in cutting cells; and as the bees had become strong in numbers before the queens matured from the newly built cells, the bees would swarm till the old hive was so depopulated that it would not build up for winter unless helped by the apiarist.

I have put before the readers of Gleanings what he said, as it so nearly described what I used to find to be a fact that I could not do better if I tried. I have often wondered how long it would take to teach bee-keepers throughout the world that such cutting of cells was a failure and worse than a failure. But there is a way of cutting queen-cells so as to entirely prevent after-swarms, which has stood the test of years with me. It is this: Wait eight days after the prime swarm issues, then cut all the cells but one, and you have a sure thing of it, as, in this case, all of the larvæ are past the age of being converted into queens. But the way I prefer, and the one I practice, is this:

On the evening of the eighth day, just before going to bed, all outside noise being hushed at this time, I listen a moment with my ear at the side of the hive which cast a swarm that long ago; and if the young queen has hatched, and the bees have concluded to send out an after-swarm, I hear the piping of the young queen, which *always* precedes the issue of an after-swarm. If I hear this piping, I open the hive early the next morning and cut off every queen-cell which is found, shaking off the bees from each frame in front of the entrance, so that no cells will be missed. There is now no guess-work or hope so about it, but a sure thing, as one queen has her liberty and you take away all the rest. In all other ways there is a possibility that the cell left may not hatch, in which case the colony will be queenless; but in this case we know that there is a young queen present, for we heard her say so the night previous. If no piping is heard when we listen, then listen again the next night, and so on to the night of the sixteenth day; and if no piping is heard then, we may know the bees have concluded not to send out any after-swarm.

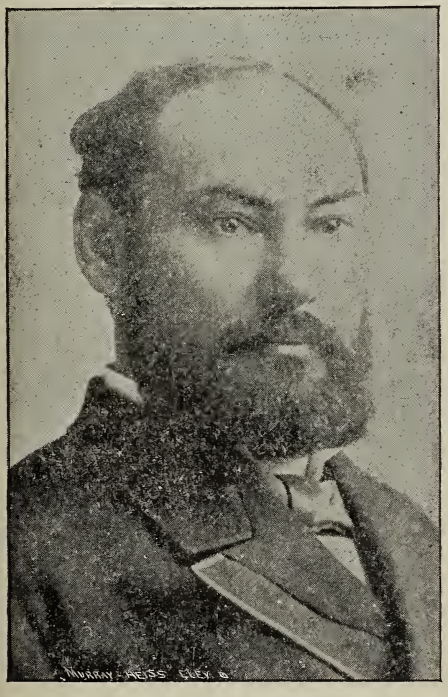
This seems like quite an undertaking; but let me say to the reader, that, in practice, it is not half the work required by the old plans, considering the certainty there is in it. But I think I hear Dr. Miller saying, "You ought to know that I meant neither of these kinds of swarming. I meant the prime swarm." Well, this being so I accept the statement as true, but wish to add that I believe much honey is lost which might have been secured had the bees been allowed to swarm when they got ready, instead of throwing them out of a normal condition by cutting cells, and then having them swarm at last under conditions not so favorable for a crop of surplus honey as would have been had they been let alone.

Borodino, N. Y. G. M. Doolittle.

PROF. H. W. WILEY.

BIOGRAPHICAL.

When we met Prof. Wiley, the Chief Chemist of the Department of Agriculture, at the Washington convention, we were very favorably impressed with his general appearance. Although we had previous intimations that we had misjudged him in the past, we felt very sure of it then. In answer to many inquiries, we would say that Prof. Wiley is the man who started what has been called the "Wiley canard;" but as he now seriously regrets it—as much so as any bee-keeper—and seems disposed to render every assistance, we feel sure that every one will be glad to make his acquaintance, and forget the past. He impressed us as being a gentleman in every respect—a scholar and a scientist; and as he is in a position to do us great service, we take pleasure in introducing him to the bee-men.



PROF. H. W. WILEY.

Harvey W. Wiley, Chief of the Chemical Division of the U. S. Department of Agriculture, at Washington, D. C., was born at Kent, Jefferson Co., Ind. He graduated from Hanover College in 1867, receiving the degree of A. B. Subsequently the degrees of A. M. and Ph. D. were conferred upon him by the same institution. He commenced his public career as professor of Latin and Greek in Butler University, where he remained three years. In 1871 he took the degree of M. D. at the Indiana Medical College, and the following year became a teacher of science in the Indianapolis High School. In 1873 he graduated from Harvard University with the degree of S. B., and in 1874 accepted the chair of chemistry in Butler University, which he occupied for only a short time, being called to a similar position in Purdue University, the Agricultural College of Indiana, where he remained until 1883, with the exception of one year spent at the University of Berlin. From 1881 to 1883 he served as State Chemist of Indiana, and for three years (1874–7) was professor of chemistry in the Indiana Medical College.

When State Chemist of Indiana, Prof. Wiley directed much of his attention to the study of glucoses and sugars, and his reputation as an expert on these subjects resulted in a call to his present position as Chemist of the Department of Agriculture. Under his capable supervision the chemical laboratory of that Department has rapidly improved, the scope of the work been enlarged, and methods systematized, until at present it ranks as one of the foremost laboratories of the country.

Aside from his general scientific pursuits, Prof. Wiley has pushed his investigations in two special directions; namely, the solution of the problem of increasing our sugar production, and the adulteration of foods and the various methods for its detection.

In the interest of the former of these subjects he visited in 1886 the principal sugar-factories of Europe, inspected the different kinds of machinery, methods of operation, etc. As a result of this visit the diffusion process was introduced into this country, and is at present in use in some of the large sugar-plantations of the United States. During the whole period of his connection with the Department of Agriculture, Prof. Wiley has been the director of the government sugar-experiment stations, and was the originator of the alcohol process —a trial of which was so successfully made in Kansas two years ago. The skill and perseverance displayed by him in carrying on these experiments, and the service rendered to a great agricultural industry, entitle him to much commendation. He has interested himself in the development of new, and the improvement of old varieties of sugar-producing plants, and has, in short, done more, in a scientific way, than any other one man to develop and put on a paying basis the sugar-industry of the country.

In pursuing his scientific researches, honey has received particular attention from Prof. Wiley. He is in hearty accord with the bee-keepers of the country; has delivered addresses before the American Bee-keepers' Association, and devoted much time to the establishment of accurate and reliable methods for detecting adulterations of honey. All known methods of honey analysis have been carefully tried under his direction, and, as a result of this work, together with the new processes he has devised, it is possible now to detect all adulterations of honey when practiced on a commercial scale.

One of the most interesting and useful of the new processes devised by Prof. Wiley consists in the detection of the percentage of levulose in honey by means of its deportment with polarized light at widely separated temperatures. There are still many points in connection with honey analysis which require more careful elaboration, and to the solution of these problems Prof. Wiley is giving much of his time. He will not rest satisfied until the bee-keeper is absolutely relieved from the disastrous competition of the honey-adulterator in all the markets of the United States.

Prof. Wiley is connected with various scientific societies. He has served as president of the Washington Chemical Society; president of the Chemical Section of the American Association for the Advancement of Science; president of the Association of Official Agricultural

Chemists, and is and has been for seven years its permanent secretary and executive officer. At the present time he is president of the American Chemical Society—a rapidly growing national organization numbering over five hundred members, and embracing many prominent American chemists. He has published a large number of scientific papers, together with numerous addresses and government reports, both of a technical and popular character, and has announced for publication a text-book on Agricultural Chemical Analysis, which will be the most elaborate work of the kind ever issued from the press. At the present time Prof. Wiley is Chairman of the Joint Committee having in charge the World's Congress of Chemists, which is to meet in Chicago on the 21st of August proximo.

THOSE NEW-FANGLED TRAPS.

WILL IT PAY THE AVERAGE BEE-KEEPER TO INVEST IN THEM? THE LANGDON NON-SWARMER, ETC.

Dear Friend Root:—I have been reading Gleanings with much interest for some time back, and in particular what pertains to self-hivers, non-swarmers, and queen-traps. Now, do you really think that it is best for us, all things considered, to adopt so many new traps simply to try to make our bees do something contrary to their natural instincts? And don't we lose, by so doing, the snap and vigor with which a new swarm goes to work after being hived in the good old way? Besides that, I think the majority of bee-keepers agree with me, that they can get more honey, especially in the comb, from the old colony and its swarm than they could if the old colony did not swarm at all; and as to the increase of stock, I don't think there will be much kicking on that score as long as we have winter losses like the past winter. And is it really cheaper and better to invest in those new inventions than to hire help during the swarming season? Those traps and devices must be put on the hives and taken off again, as well as looked after while on. We must also have a place to store them when not in use. I think that, by looking this question squarely in the face, and considering all things connected with it, there will be fewer of these devices in use ten years from now than there are at present.

Some few people may find trouble in getting help. They can't find a suitable man? Well, then, what is the matter with hiring a woman? or perhaps you have a daughter who would take an interest in bees, and hive swarms, if paid four or five dollars a week; if not, there is always some other man's daughter in your neighborhood who would be glad to take the position rather than to go to some factory to work, as a great many girls and young women do in this district (of course, this is not intended for the Rambler). And, by the way, I think we should be doing more good to the community by paying our money to some person in need of employment to hive our swarms, if the results were the same as far as our bees are concerned, than by using the devices alluded to.

Graysville, Pa., July 8. P. D. Miller.

[There is danger in going to extremes both ways. It is folly for the average bee-keeper to invest in *every* new thing; and on the other hand it is folly to always go along in the same old rut, without looking for some better way. A wise discrimination should be exercised, and new things that promise well should be tried on a limited scale; and if the trial of a few justifies the trial of more, well and good. We are glad that our correspondent has written as he has, because we fear there is a tendency on the part of bee-keepers to rush to the other extreme.]

FLORIDA.

GRAPEVINES FOR SHADE; HONEY CANDYING, ETC.

In reply to W. U. R.'s question, page 525, July 1, I will say there is no better shade for bees in Florida than the scuppernong family of grapevines. Build an arbor such as is illustrated on page 625, September 1st Gleanings of 1890, and cover it the same way, and you have almost a perfect shade for bees, and an abundance of fine fruit. It will not take over two years to cover the sheds (or arbors) if vines are set forty feet apart on each side; and after that some can be taken out as they get crowded. I consider the Thomas variety the best. It is a large purple grape. They drop their leaves in winter and let the sun in on the hives, and put on leaves to shade them at the right time in the spring. One vine under favorable conditions may be made to cover densely a quarter of an acre, and there are vines much larger than this that bear so many bushels of grapes I dare not give the figures. My grape crop from these vines this year will net me as much as my honey crop, according to present prospects.

While the vines are small the sheds can be covered with cabbage-palmetto leaves tied on to wire or nailed on to 1x2 wooden slats. These once properly put on will last until the vines cover the sheds.

I set my posts 8 feet apart each way, and use 2x4 scantling 10 feet long to tie them crosswise and support wires or slats. These are nailed at a height to clear the head at the front, and some 6 to 8 inches higher at the back.

S. P. (page 526) can not keep his honey from candying. It will not ripen in the hive so but that it will candy more or less, even though left right there; and when his bees are raising brood in the latter part of winter and early spring he will find little white pellets of it tumbled out of the hive by the bees after they have sucked out all the liquid honey that they can get. I have evaporated saw-palmetto honey (that least liable to granulate) down to where it felt like putty, in my sun evaporator, and still it will partly granulate. Why not let it granulate all that it will, and educate consumers up to the fact that the granulation is a guarantee of purity that can not be disputed, and that it takes only a little heat to liquefy it, as is the case with maple sugar?

The honey crop here is almost a total failure up to date; and even should the mangrove yield honey from this time until the close of the bloom, but little honey would be gathered, as the bees are not in shape to do rapid work.

This is the first season in my sixteen years' experience in bee-keeping here that the black mangrove has put on a liberal bloom and yet secreted no honey. I believe it to be in this section as reliable a honey-producer as there is in existence. Its roots are covered twice each 24 hours by the tides. We have had a very dry May and June, but it would seem as though drouth should have little or no effect upon it. Some climatic or electric condition unknown to us is probably responsible for keeping several of our apiarists away from the World's Fair who had calculated on their honey crop to supply the means. As the orange-groves are flourishing, I think you will see me there a little later, brothers Root and Mason.

Sarah Thacker, page 527, has probably been misled by W. M. Hoge's rascality. Those who should know, say that there is not a particle of honey in his widely advertised "Honey of Figs." I know him to be a rascal and a cheat, to be avoided by all honest men.

Hawks Park, Fla., July 11. W. S. HART.

RAMBLE 89.

CALIFORNIA HONEY; WHAT CAUSES IT TO DROP IN PRICE, ETC.?

The notice, upon the borders of the Rambler's apiary. "Danger to horses and women," and the temper of the bees, had a very salutary effect upon my neighbors, resulting in their keeping afar off. For instance, one evening, just as the work of the day had been finished up, a shout attracted my attention; and, adjusting my "spects," I saw a fellow an eighth of a mile away, among the greasewood bushes, swinging something in his hand that looked very much like a jack-rabbit. I thought he wanted to give it to me, and shouted to him, "No! don't want him," and turned toward my cabin; but he shouted and gesticulated all the more, and I went down to see what the ado was about. A nearer view showed that, instead of a rabbit, he was swinging a wooden-jacketed two-gallon can, and wanted honey. His wants were supplied, and, after soothing his fears by telling him that the bees had gone to roost, I interested him by showing the operation of the honey-extractor. His wife was still further away in the bushes, with the horse and road-cart, and it took our united shouts and persuasions to get her to drive up anywhere near the apiary. A big June-bug flew over her head, and the gone-to-roost theory had but little weight with her; and as soon as her husband and the honey were adjusted, the whip was applied, and away they went, with my most benign smiles following them. Other lovers of honey in Bloomington were also in a nervous state over bees, June-bugs, etc.; and now whenever the Rambler walks over to the post-office for his mail, charming ladies, with an empty pail in hand, will request that, "the next time you come over, take this pail and bring me two bits' worth of honey." Sometimes

PEDDLING HONEY "A LA CHINAMAN."

I have more pails of various sizes than I know what to do with. Now, Jake Smith's plan for peddling honey on a "syckle" may do for Jake's boy on a smooth road; but when it comes to following a blind trail through grease-wood bushes and cactus-plants, the "syckle" is clearly out, and I think of adopting the Chinese plan as far better. The slant-eyed Mongolians have a way of carrying quite large loads of various articles by properly balancing them over the shoulder, on a long pole; and so my plan for distributing honey is, to attach my multitude of pails to a pole, as shown in the sketch.

Although there are many in this State whose palate delights to be tickled with a touch of honey, there is not so much consumed here as there would be if we had a colder climate. Honey is a heat-producing food; and as our climate supplies nearly all of the exterior heat that the system demands, the interior application of heat in the form of food is not called for. The great bulk of our honey is, therefore, shipped to other consumers, and our sales of honey are probably conducted upon a larger scale, and different from methods in vogue in any other State in the Union. It is safe to say that there is no other portion of the country, with an equal area, that ships so many carloads of honey as Southern California.

The clouds and winds during the rainy season are watched with care by the bee-keeper. If the winds blow from the right quarter to bring rain, there is evident pleasure; but when, after a few drops fall, the wind changes and the skies become clear, there is liable to be a spell of the blues. It may be surmised, then, what the effect is when several inches of rain falls; and the more inches recorded, the higher the spirits rise. Over 20 inches of rain is quite a sure indication that there will be a good honey-flow.

The next anxious condition the honey-producer gets into is when he begins to whirl the extractor, and the honey begins to flow. About this time the local dealers begin to come around to renew their acquaintance with the bee-men, or a new buyer may be on the ground, and, of course, he is very affable, and wishes to be remembered when you sell your honey. Upon these first rounds no prices are offered, and the producer's mind is left in a state of speculation. After a few tons of honey begin to accumulate, the dealer comes around again, and this time carefully makes an offer. It is usually low enough to suit the most exacting bee-keeper, and not a few grasp at it as a drowning man grasps at a straw, and, of course, a carload sold at the lowest figure the dealer dare offer sets the price for all of the rest. This year the price offered for extracted honey has been 4½ cents, and this long before any one knew whether the yield would be large or small. The dealer, of course, has great stories to relate about great yields here and there, while the fact appears, at this date, that, though we had a fine rainfall, the honey-yield as compared with the crop of 1886 is but an average crop.

The Rambler contends that the obstacles the honey-producer has to contend with in order to obtain uniform prices for his honey are small in comparison with the fruit-industry. The greatest obstacle is the selling of the honey for first offers, and long before the real output is known. These first and low offers are taken usually by producers whose need of money is immediate. For instance, a bee-keeper, thus in need of money, drove out with a dealer to one of his apiaries, and sold the honey there for 4½ cents; they then went to another apiary, and half the honey in that apiary was sold for 4¾; and before they reached town the other half was sold for 5 cents, and the honey all of the same quality—sage. If the dealer was willing to pay 5 cents for a portion, it is reasonable to suppose that 5 cents could have been obtained for all of it. In Wall Street parlance, the dealer is a bear—he bears down upon the price

all he can. What we need is a good healthy bull to boost the price up. I think the bull could be found in thorough organization. I find that California bee-keepers do not enter-

WHAT CALIFORNIA BEE-KEEPERS NEED.

tain ideas of exorbitant prices for their product. Their ideas range between 5 and 6 cents, with a strong leaning, of course, toward the latter, and about 10 cents for comb honey. A uniform price of 5½ cents this season would have been satisfactory, I think, though some are still holding for the 6. That a better order of things will come out of the present chaos is the hope of the RAMBLER.

A RHODE ISLANDER'S SUCCESSFUL WAY OF WINTERING.

HE ARGUES FOR SEALED COVERS.

The following described method of wintering bees has, in twelve successive years, proved to be the ideal way for this climate. Situated close to the salt water, where the weather is very changeable, varying from ten to fifteen degrees below zero to fifty or sixty above it within a day or two, and severe cold frequently followed by warm dense fogs, with the moisture condensing on every thing, have proved to be a combination hard to overcome. The fall honey-flow, also, has to be taken into account, as its earliness or lateness and quality all affect the preparations.

As soon as the supers are removed, the combs are reduced to seven or eight, and the stores are equalized. About Sept. 15th, varying according to the season, a final inspection is made, and the enameled mats are put on for good, not to be disturbed again until the following spring. The bees soon have every thing glued up air-tight, and also have built up under the mats such winter passageways as they want. These latter are easily and quickly removed in the spring, and yield quite a lot of wax. Within a couple of weeks the sawdust packing is put in, using it about three inches thick on sides, ends, and top. Under the hives, leaves are generally pushed, but not always. The hives are single-wall, with outer case for winter, and some are "Falcon" chaff. All have eight-inch entrances, which are left wide open all winter.

The non-disturbance of the mats until late spring I find very important. The condition of a colony can be easily told by a glance under the combs, and a look at the entrance; and a little listening will frequently do. Of course, the ages of all queens are known. If a colony is running down, little can be done for it until well in the spring, and then it is most profitable to unite it with one of its *stronger* neighbors—never with another weak one.

All ways of preparation, with frames varying from 4½ inches to 20 inches deep, have been thoroughly tried, and the foregoing succeeds every time. ARTHUR C. MILLER.

Providence, R. I., July 12.

BEES OF INDIA.

AN INTERESTING LETTER; MORE ABOUT THAT HONEY ON A STICK.

A. I. Root:—Some three months ago you printed an account of a new race of bees in India, which made their honey around a stick or twig. I was so much interested in the matter that I wrote to the address given, the Rev. W. R. Manley, who has replied in the interesting letter which I inclose for you to make such use of as you think proper.

JULIUS TOMLINSON.

Allegan, Mich., July 13.

[Mr. Manley's letter is as follows:]

Mr. Julius Tomlinson:—Yours of April 18, and the newspaper containing some remarks of the Rev. D. H. Drake, in regard to our Indian honey-bees, came by last week's mail. I am sorry that the information I can give you in reply to your questions will have little scientific value, as I am not an entomologist, and have never made any special study of the bees of this country. Besides, I am dependent, in part, for the statements I shall make, upon information derived from natives who have little idea of scientific distinctions, or of strict accuracy in stating what they know; but what I shall give you outside of my own observation is, to the best of my knowledge, reliable.

There are said to be four distinct varieties of honey-bee in this country, and all of them different from the honey-bee of America. My old friend Mr. Drake is wrong, however, in referring them exclusively to Udayagiri. They exist certainly in other places in the Madras Presidency, and doubtless all over India. Udayagiri honey has indeed a local reputation, like Michigan potatoes or Minnesota wheat, but this is due to purely local circumstances, and not to any peculiarity of variety.

We used to have a great deal of honey brought to us at Ongole, eighty miles from here, but nearly all of it had such a rank taste as to make it unfit for table use. I have also eaten honey produced in the Shevaroy Hills, at an elevation of 5000 feet; but though it was considered very fine by those who lived there, it was far from being as good as the Udayagiri honey. This, also, varies greatly in quality. We bought some not long since which had a distinctly bitter flavor, from being made, so the native that brought it said, from the flowers of the margosa, a tree the leaf and bark of which have an intensely bitter taste; while on the day your letter arrived we bought some more that was very nice. None of the honey that we get here, however, has quite the taste of the tame honey at home. There is always more or less of a peculiar flavor that detracts a good deal from the quality.

The kind of honey described by Mr. Drake is made by a bee not more than half the size of the American bee. It is usually placed, as he says, around a small twig, a single comb in a place, six to eight inches long by two or three in thickness; but that we used to have offered us in Ongola was often attached to a prickly-pear leaf, and we got our mouths filled with cactus thorns before we learned to let such as that alone. I am sorry that I can give you no information in regard to the bee itself, farther than its small size and the fact that its honey is always placed in the open air. Honey of this kind is usually brought in the comb, and is apt to have a good deal of "bee-bread" in it, with some young bees. The number of bees in a single colony

is probably small, to judge from the size of the comb.

The natives tell me of two other varieties, smaller still than the one I have described, but said to be true honey-bees. These deposit their honey in hollow trees, or in holes in walls, or among rocks. There is but little of it, and it is said to be of very inferior quality. I have never seen them, but there seems no reason to doubt that such exist; the smaller variety of the two, as described to me by a native of Udayagiri Hill, who brings us a good deal of honey, being about as large as houseflies.

There is still another variety of bee which makes most of the honey we buy. This is considerably larger than your tame bee, the hinder part of the body being longer and more pointed, while the wings and head are of a dark smoky color. I should judge there were about as many of these in a colony as of the tame bees at home. They usually attach their comb to the under surface of an overhanging rock on the face of a cliff, inaccessible to any thing but human ingenuity; and the single comb which they make is about a foot and a half broad where it adheres to the rock, of about the same depth, and three or four inches in thickness. Whether the wax of which these combs are made is essentially different from that of our domestic bees in America, I do not know; but it seems to have the power of resisting the intense heat of a blazing sun in a way that I am quite certain the comb of our tame bees would not.

In gathering this kind of honey the natives let themselves down by a rope from above; and the story is told here of one man who went alone to rob some bees, as he did not wish to share his spoils with another; but the rope by which he climbed down gave way, and he was killed by falling to the bottom of the precipice. In the Shevaroy Hills the natives use ladders of split bamboo instead of ropes. These can be made as long as required by lashing pieces together. It is then lowered over the cliff, and a man climbs down to where the honey is. Fires are usually built below the bees in order to stupefy them by the smoke; but this in most cases would have little effect, owing to the height of the bees from the foot of the cliff. However, I have been told by those who bring us honey that they care little for the sting of the bees, having become so inoculated with the poison that it produces little effect.

The temper of these large bees is quite as uncertain as that of our tame bees at home. I once saw a colony of them that had attached their comb to the under side of a beam over a driveway in front of the judge's court in Nellore, and were working away apparently without disturbing, or being disturbed by, the crowds of people that were constantly coming and going. On the other hand, there are three swarms of them on the face of the cliff near a spring from which our drinking-water is brought while we are on the hill, and a few days ago they attacked and stung an old man and a boy, apparently without any provocation. The old man comes up every day with our mail and marketing, and the boy, a relative of one of our servants, was going down with him. They had stopped at the spring to eat some food when the bees commenced stinging the boy. The old man wrapped his own upper cloth around the boy and brought him back up to the house; but in doing so he had left his own body exposed, and stings by dozens were picked out of his body and legs and the boy's head. There was no immediate swelling, though the pain seemed to be severe. I gave them some simple remedies, and the old man went down the hill. The boy remained, and the next morning his face was swollen beyond recognition. The swelling did not subside for three days, and it was longer than that before the old man was able to climb the hill again. From this it would seem that the poison injected by the sting of these bees does not act so quickly as that of our tame bees, but is no less potent.

You speak of them as a *new* variety of bees. They may be new so far as knowledge of them in America is concerned, but they are probably much older, in point of fact, than our own domestic bees, and, so far as I can learn, have never been domesticated. The wild bees which abounded in Palestine in Bible times probably did not differ greatly if at all from those found in India to-day.

The price of honey varies with the season. In times of excessive drouth it is scarcely to be had at any price. The natives, of course, destroy every colony of bees they rob; and in a country like this part of India, with its scanty rainfall and frequent drouths, the wonder is, almost, that the bees do not become exterminated. This is one of the abundant years, and we are offered much more than we have any use for; still, it is not really cheap. For seven pounds of strained honey the other day my wife gave a rupee and a half, which, at the present rate of exchange, would be about seven cents a pound. This, considering comparative quality and the relative value of money, is quite as dear as good American honey at twenty-five cents a pound.

W. R. Manley.

Udayagiri, Madras Presidency, India, May 30.

[We are not able to identify the races of bees mentioned by Mr. Manley. Possibly Mr. Benton can enlighten us. We should be pleased, also, to have him tell us what he knows about the bees that put their honey "on a stick."]

REPORT FROM GERMANY.

BY THE EDITOR OF THE "ILLUSTRIERTE BIENENZEITUNG.

The season of 1892 in Germany was a remarkable one. In some sections of the "land of Dzierzon" the honey crop was a total failure; in others the bees got their winter stores; and in others they stored more honey than was ever before reported in our bee-journals. In North Germany we had a very good crop from linden (basswood), locust, and other honey-plants; and in South Germany there has been a flow of honey from fir-trees. Some colonies gave 200 to 300 lbs. of rich extracted honey, besides winter stores. About the source of this honey, our doctors disagree. Doctor Dzierzon asserts that this honey, not being gathered from the nectaries of blossoms, was the product of the excrement of the tree-lice; and some doctors, and with them the most of the practical bee-keepers, say it is a product of the sap of the plants, which would secrete on the upper side of the leaves after very hot days and chilly nights. Other of the German bee-keepers think both of these opinions are right, so that we may as well have plant-lice honey as honey from the sap of the plants. Now, every bee-keeper knows that plant-louse honey is dangerous as food for the bees to winter on, and therefore many German bee-keepers were anxious about this species of honey from the sap of the plants. But though the winter was severe, all the bees in Germany came out very well. So it proved that the honey from the fir-trees was not dangerous—at least, not so this winter. This honey has a very dark color. It is darker than the honey from buckwheat; yes, it is nearly black and glutinous, and has a smell and taste like tannin.

That the bees in Germany, where nearly all bee-keepers prefer outdoor wintering, came out very well, was, of course, besides other circumstances, the result of some fine days we had in the middle of February, when our bees had a successful cleansing flight. But from this time till to the beginning of June we had cold, rough, stormy days, and now and then night-frosts. On the morning of June 20 the leaves of the potatoes were injured in this way, and no rain worth mentioning. It has so happened that these days were always mixed up with some very fine ones, on which our bees not only could fly out, but found from the end of March more or less new honey and pollen. This, I think, was the reason that the bees in Germany prospered; and so much the more, when the bee-keeper had planted some honey and pollen yielding plants in the neighborhood of his apiary. Please do not misunderstand me in this case. I am fully aware that the planting of some patches—yes, some acres—of honey-

plants will not suffice to put the extractor in motion or to get filled supers of comb honey. No, the gain of such planting lies in another direction. According to a common saying of our old experienced bee-masters, "One ounce of newly gathered honey and pollen, carried into the entrance of the hive by the bees, is worth more than one pound from the old storage in the hive or feeding." I am of opinion that drops of honey and little bits of pollen gathered early in the spring will agree well with the health of a colony, causing them to thrive, even if after some fine days followed by some very bad weather. Experience has taught me so, and the last spring has confirmed it.

For more than twenty years I have taken care that my bees find on their flights, early in the spring, some fresh honey and pollen; and therefore I planted in the apiary, or close by, snowdrops, crocuses, scrophularia vernalis, willows, and winter rape. I sowed the rape in the month of August on a patch two rods square. Rape is one of our best honey-plants, and will blossom early or late in the month of April, according to the weather. New honey and pollen, although they came in driblets, have the stimulative effect peculiar to spring, and will serve to make the old stores in the hive, or the food one may be feeding, agreeable to the bees, and at the same time will do them much good. Of course, the more bees can gather from this fresh honey and pollen, the better it is for them. In most parts of Germany the plants yielded this year, from the end of April till the beginning of July, so much honey during those fine days that followed the bad ones, that, at the time of fruit-blossoms, the extractor had to be set in motion to keep the honey from crowding out the brood.

The first natural swarms appeared in April, some in May; but only a few. Where the extractor was not used at the right time, there was no swarming at all.

On the beginning of June the cold and stormy days were over: hot days and warm nights set in, and prevailed till this time. The reports from South Germany tell us that the fir-trees yield as much honey as in the year before. In North Germany, at least here in Wilsnack, we have not such honey, and only honey from the blossoms of the plants. Therefore I can say that we have had a very good honey season till now; and if buckwheat and heather will yield as much honey as the other honey-plants have yielded, we in Germany may say that the year 1893 was one of the best ones in Germany we have had for a decade.

C. J. H. Gravenhorst.

Wilsnack, Germany, July 5.

THE THREE METHODS OF QUEEN-REARING.

DOOLITTLE'S PREFERRED; J. D. FOOSHE DESCRIBES HOW HE USES IT.

Friend Root:—I have just received Gleanings, and have read some articles with pleasure. Gleanings is always good, but now and then we see an article from some one of experience along the line we are working on. This number has an article from S. F. Trego, on cell-building. I have been interested in this subject for ten or twelve years, and have made queen-rearing a specialty; therefore I like to read any thing I see pertaining to it. I have tried three plans, and will give them as I learned and experimented with them.

1. By removing the queen and letting the bees build cells, or placing a frame of choice brood, of the right age, in a queenless colony. Neither of these gives cells enough. The frame of brood inserted in a queenless colony is better, as they will build as many cells on one frame as they will on all the frames the other way.

2. By cutting strips of comb containing larvæ of the right age, and fastening to the bar—about three bars—including top, and known as the Alley plan.

3. The Doolittle wax-cup plan. These I fasten to bars, as on the Alley plan, and transfer the larvæ, which we might term grafting. The latter plan I have almost entirely adopted, because I can get more cells built out by that plan than by any other, and they stand well apart, and in nice condition to place in protectors. I generally have them built out in double stories above the excluder; but when there is no honey coming in, there is a great deal of risk in upper stories unless the excluder is of the right size. Mine is larger than the more modern make, and therefore queens sometimes get above; and even if they do not, the inquisitive little fellows will very often tear down the cells, commencing about two days before they are to hatch; therefore, to have cells built in an upper story, the colony ought to be very strong—so much so that the bees should be inclined to build comb. I like this cup plan better than the other two, because there is no mutilation of comb, and we get cells that hatch with more regularity. I notice you say that you have never succeeded with this plan satisfactorily. I gave my plan a year or two ago, by which I never failed to get a half or more of the cups accepted. I usually put forty to fifty cups into a colony which has been made queenless, and from which all brood has been removed, say, six hours, or long enough for them to moan when you open up their hive. When they do that, the colony is in proper condition to receive cells with larvæ, and not before. Some colonies will not moan or cry under 12 hours, and sometimes not at all; but when they don't, they never start as many cells as when they do. The cells, before giving the larvæ, should have hung in a weak hive for a few hours, say 12 to 24, before transferring the larvæ. I always get better cells, and more of them, by this plan than by either of the other two. The objection to the first plan mentioned is, that the combs are mutilated, and the cells are irregular in hatching, and it does not give as many cells at a time as I should wish to run 100 nuclei or over.

I like the Alley plan better than the first; but it has the objectionable feature of crowding the cells together, and irregularity of hatching, and also of mutilating the combs; but if the combs are patched with worker comb at the time the larva is cut out, it is not so objectionable, as there is no danger of the bees building drone comb; but we all know that, unless we are careful to give the combs to hives containing young queens, they will, as a rule, patch them with drone comb. When I followed that plan I had a great many combs with drone comb built wherever I cut out chunks of comb for larvæ, so I was glad when I found a better way. I have tried the plan Mr. Trego gives, when I have been pushed for cells, but I was always afraid to follow that up, as we are liable to have cells started on larvæ from an inferior queen. Unless they are well marked I am very apt to make a mistake; and to follow the plan successfully, all the larvæ around the cells started should be killed; but even then there will be many cells that can't be separated. And I also find that, to transfer a young larva of the right age (which is about one day after the egg has hatched) to a cell containing royal jelly two days old, the bees often clean out the jelly and commence new. I have never tried giving a larva of about the same age as the one in the cell containing royal

jelly; but I don't think any larvæ will make as good queens as the ones a day old. I think I shall experiment a little by transferring larvæ of about the same age as the one imbedded in the cup, say after it has been fed two days. With the wax-cup plan I often take the head of a wire nail and insert it into cups of royal jelly, and smear the bottom of new cups that have not hung in a hive, for the bees to glaze, and place the larva in it, and the bees generally accept about the same percentage.

Now, friend Root, all of our plans will work well when honey is coming in freely; but when the season is over, and we have to rear queens out of season, as I do the year round, we had better have a true and tried plan. I buy black and hybrid colonies every year when I can get them; but I supplant the queens as soon as possible, or make nuclei of them. If I have any drones in them I transfer them and place an empty hive at the bottom, with a queen-excluder on it, and above that another empty hive to receive the combs. I then cage the queen and shake all the bees off in front of the hive, and put the frame into the top hive, and then place the queen on top of the frames, cover them up, and the next morning remove the bottom hive, after stopping it up so that no drones can get out, and then we can have a drone-killing or drone-perishing, as suits the fancy.

This is the poorest season we have ever passed through here. I am glad to see encouraging reports, even if I am not in it. To tell the reason would make this article too long; so I will write some other time and tell how I manage my bees and queen-rearing department during a poor season.

VIRGIN VS. LAYING QUEENS FOR GOING THROUGH PERFORATED ZINC.

I will answer Dr. Miller with regard to virgin queens going through excluders, that laying queens, even if they can go through, are not disposed to do so. My experience is, that a virgin queen that hatches in an upper story without brood, and, better, unsealed brood, will, as a rule, find her way through the excluder, and in a few days a fine laying queen will be supplanted. I lost two or three very fine queens this year that way. It nearly always happens that, when a young queen happens to hatch among the bees, she kills the old one; which proves to me that queens do not always depend on the bees to do the killing. I am surprised at the two queens being alive when they arrived at your place. They would always fight when they got together, for me. I am always careful not to expose them to each other. Last year I had an imported queen which you ordered for me. She was introduced safely into a colony that I had had at cell-building. She had begun to lay, and in a day or two I opened the hive to take a peep at her. The first thing I saw was a nice little virgin queen. I was satisfied, without looking any further, that my imported queen was killed, and, sure enough, I found her on the bottom-board, apparently very recently killed. If a virgin queen gets into a colony of bees with a laying queen, the bees will do the work; but when the queen is hatched in the hive, and has been crawling about among them for two or three days, she will nearly always kill the old queen. I think that, perhaps, the old queen can squeeze through as small an opening as a young one; but they will not make such persistent efforts. J. D. Fooshe.

Coronaca, S. C., July 8.

[We will explain to our readers, that Mr. Fooshe is our Southern queen-breeder; and while his name does not appear in the advertising columns, nevertheless he is one who rears the larger portion of the queens we sell early in the season, and a considerable number later on. When it comes to the rearing of untested queens we find that our Southern breeders can rear them cheaper than we can here in the North.]

WILLIE ATCHLEY.

THE MOST EXTENSIVE QUEEN-BREEDING BOY APIARIST IN THE WORLD.

The subject of this sketch was born in Sparta, White Co., Tenn., Nov. 22, 1876, and came with his parents to Texas in the fall of 1877. He walked across the house at the age of eight months. At the age of five years he drove a delivery-wagon to any part of the city of Dallas. He has been brought up in the bee-yards, and does not know when he learned to manage bees, but has *grown* into the business. He is to-day, so far as we know, the best queen-raiser of his age in the world, and the best

WILLIE ATCHLEY.

posted in bee culture of any boy of his age. It is a knotty question indeed that he can not properly answer about bees. He has raised thousands and thousands of queens, and by all the methods known to most bee-keepers. He says he liked the Doolittle plan better than any thing else up to this present season, but he has discovered a new plan that he likes better than any yet tried. He says that the Alley plan is no surer way to get cells than the Doolittle way, as neither is a fast and sure way; but at certain seasons he can get the bees to accept and finish up nearly all the cells by the

Doolittle method. He says that the bees will destroy just about as many of the eggs and little larvæ of the Alley plan as they will fail to accept of the Doolittle plan; and having so many cells to start, and at times when they were most needed, the bees would not save as many as he wished. So he has been all this year working to get a better way, and has found it. His own description is as follows:

MRS. JENNIE ATCHLEY.

Dip the cells the same as by the Doolittle way, but leave the lower end of the cell-dipping stick the same size as the bottom of a worker-cell, an eighth of an inch; then let the stick be the size of the inside of a natural queen-cell up, say, about half an inch, like the cut. Now dip

WILLIE ATCHLEY'S CELL-CUP STICK.

the cells and it will leave a little hole in the bottom of the cell-cup an eighth of an inch deep. Now have your breeder lay in a comb that bees have hatched in; two or three times is best; and when the eggs begin to hatch into larvæ, say when about 10 to 24 hours old, then cut out a piece containing as many larvæ as you think you will need. Take a knife as sharp as a razor (I use a razor); pare down the cells just as low as you can and not disturb the larva. Now, just about as fast as you can move your hands, lift out the cocoons and place them in the bottom of the cell-cups in the little pit made for them; and if your stick is made just right, the cocoons will fit snugly enough to stay firmly.

When properly put in, the lining will just come up even with the bottom of the cell-cup proper. You see, the larva is not moved nor touched, and will live several hours without attention from the bees should they fail to see to them at once; while by the Doolittle plan of moving larvæ and putting in royal jelly the little larvæ sometimes dry up before the bees feed them, or they come so near starving that they get a setback which they never recover from. I am getting as fine queens as I ever saw by any process, and the bees always take care of them better than by the Doolittle plan.

Of course, I do not claim that the bees save them all, as I have seen bees destroy part of the cells that they had started naturally, so they are going to have their own way about it; but they save as many as two-thirds, and often all, for me, by this method. You see, the food the workers and queens eat is practically the same for a while, and possibly all the time, for aught I know; but the queen gets more of it, and thicker, when she is old enough to use it. So it makes no difference about the jelly; but I try to get larvæ that are well fed, as the bees seem to like them better. I tried cutting out the base or bottom of new comb, and placing in cell-cups, but was not very successful; and, in fact, I was puzzled to get tools sufficient to handle my cocoons, till Mr. Root sent us some long sharp-pointed tweezers to pull bee-stings with; and you ought to have seen me jump and grab them as soon as I espied what they were for. We were not looking for the tweezers, as Mr. Root had not told us he was sending them. We now have four pairs of these tweezers, as we ordered more from Mr. Root at once.

I have combined the Alley plan, the Doolittle plan, and my plan; and together I have the best, fastest, and most scientific plan I ever saw. Why I say I have combined all three is, I take a colony of bees that have lots of young bees, and take their brood all away, and keep them shut up on frames of honey, and no brood or queen from 12 to 24 hours; then give them a lot of my cell-cups placed on the combs by sinking the cells into the comb enough to stay firmly; and you ought to see them work them out. I get better cells, need no royal jelly nor cutting of strips of comb; and if you want to try the best plan to raise queens, and lots of them, send to A. I. Root at once and get you a pair of tweezers that is already just right, as he has every thing anyhow—at least, every thing bee-keepers need; then go to work and raise all the cells you want, and on a large scale, if you wish, as, with bees enough, you can raise any amount. WILLIE ATCHLEY.

Greenville, Texas, July 7.

[Friend Willie has made a most important and valuable improvement on the Doolittle method. The actual improvement, however, consists in the *method* of transferring the larva and milky food without disturbing either; and the idea of cutting down the cocoons to ⅛ inch deep, so as to pick up, by means of tweezers, the little cups, as it were, containing larvæ and milky food, and pushing them into the artificial cup, is quite ingenious. Such an invention (and it is practically such) would do honor to a boy of very much older growth. We have no doubt that our friend Willie has had very much more to do with queen-rearing than any other boy of his age in the United States or any other country. We are very glad indeed to make his acquaintance, and hope he will let us hear from him again, regarding any further developments respecting queen-rearing.

The cell-cup stick, the one which Willie had found by actual test to be just right, was forwarded to us, and we instructed our engravers to make a cut showing it full size, and as exact a representation as it is possible to make. If you wish to make cell-cup sticks like Willie Atchley's, follow the engraving and you will not get far amiss.

In regard to the tweezers, perhaps we should say that we employed the Atchleys to extract 10,000 bee-stings. As we were short of bees when the order came, we thought our friends in the South could do it cheaper than we; and it seems that Willie was given the task. On one or two occasions we have done the work here at the Home of the Honey-bees. Our method, and the one that Willie followed, was to take two pairs of tweezers—one with fine points and the other with coarse. The operation of extracting the sting is as follows: The bee is grasped by the thorax, with the coarse tweezers. Just before the fine-pointed tweezers pull the sting, the other pair crush the bee, killing it instantly, and so on the operation is continued. These 10,000 stings are made into a medicine called *apis mellifica*, and it is regarded by the new school (homeopathic) as a very useful and important medicine. It can be obtained only by the means above described, by an expert bee-keeper.]

TREGO'S METHOD INDORSED.

CAN THE NATURE OF THE BEES THAT RAISE THE CELLS BE IMPARTED TO THE INMATES OF THEM?

The plan of starting cells as Mr. Trego describes, page 528, is old, but it's the best, according to my judgment, there is. It goes far ahead of the Doolittle plan of wax cups. I have used this way ever since it was given out that queens could be raised in the upper story over a full colony, and with a laying queen present. My way differs only in this respect from Mr. T.'s: I do not take the trouble to transfer the

brood, but keep enough breeding queens in strong colonies to supply strips of brood, so that, when the cells are started, and 48 hours old, they are, just as they are, with bees adhering, placed over a queen-excluder in the top story of a strong colony, to be finished. Now, I believe the nature of the bees that raise the cells can be imparted to the inmates of them. I know you can have whatever color you want by observing the color of the bees that raise the cells. That the above method of raising cells is good and almost entirely successful, you know from the splendid queens I have sent you during this season.

Now, what's the matter with the Good candy, for shipping queens on? When shall we ever learn to leave "Good" enough alone? A candy or feed that we can ship queens on any distance, and any reasonable time, ought to be let alone, at least for a while longer. What's the use of fussing with water-bottles, etc., when we have only to make the candy a little softer or harder, as to the distance they are to go? With the partition that holds the candy well waxed and covered with waxed paper, it stays where you put it, without any danger of soiling the mails. W. J. ELLISON.

Catchall, S. C., July 18.

MRS. HARRISON'S LETTER.

KEEPING COMBS IN THE CELLAR.

I arrived home from the South on the 5th day of May; and other more pressing duties occupied my mind than the apiary until the 23d day of May, when I went to work there. I found that just half of the colonies were dead, and I undertook the disagreeable task of saving the combs and cleaning the hives. They had passed the winter upon their summer stands, protected with chaff cushions in the upper story, and none of them had died of starvation.

It was so late in the season that the moths were hatching, and I removed all of them that I could; and as fast as a set of them were ready I put them back into a clean hive and carried them down cellar. After the combs had been in the cellar a week I examined all of them carefully, when the sun was shining brightly through the cellar window, and I picked out all the grubs of the moth that I could find, with a long sharp darning-needle, and all cocoons. The combs that had moths in them were put together in hives, and used for the first swarms that issued. In a week the operation was repeated, and a few that had escaped were removed. In another week they were examined, and not one found; and as the cellar windows were covered with wire gauze, and there is no outside door, I feel safe in saying that the combs will be safe from being destroyed by the moths during the remainder of the season, and no cocoons were allowed to mature. If the hives had been cleaned as fast as the colonies died early in the season, the combs would not have needed so much attention. Keeping combs in the cellar, to prevent the ravages of the bee-moth, is the best and safest way that I have ever tried.

SHADE FOR HIVES IN FLORIDA.

When I was visiting the largest apiary in the State of Florida, owned by Alderman & Roberts, Mr. Roberts (who is the practical apiarist of the firm) said, "The colonies that do the best are those in the shade of those oaks; and when those oaks are larger, I intend to put more colonies there." The oaks spoken of are what are called scrub-oaks. They are deciduous, and, if I am not mistaken, never attain to a large size. Bees in Florida rear brood all winter, and need the sun for warmth. If they are not strong to work upon the early bloom they will gather no surplus. The "winter of their discontent" is during the hot summer months. The bees of this firm at Wewahitchka were under sheds with upright roofs, and had rows of colonies at each side. Judging from what I know of the climate of Florida, I think that Mr. Roberts is correct, that colonies will be more profitable if located under trees than under sheds; and better still if they were not shaded at all during the winter. MRS. L. HARRISON.

Peoria, Ill., July 10.

WAYSIDE FRAGMENTS.

BY SOMNAMBULIST.

In our issue for June 15 we referred to the very spicy series of articles now running in the *Progressive Bee-keeper*, under the title of "Wayside Fragments," by Somnambulist. In order that our readers may have an idea of what they are, we reproduce the article as it appeared in the issue for July 1:

Not long since, in speaking of a deranged lady, our colored help exclaimed: "Fo' de Lawd, jes' aftah she's done had one of her wildest tantrums, she will sit down to the pianny and *impose* the beautifullest music you ever heerd in your bawn days!"

The thought just then occurred to me that I should not *impose* on the powers of endurance of the readers of the *Progressive* to the extent that I did last month. So, when your eye meets "Wayside Fragments," don't throw the paper aside in disgust. Here is a chance to cultivate your charity. I do not wish to be the *only* one who peruses "Fragments." "Misery loves company," and, besides, there is one subject herein mentioned to which I wish you to give your serious attention. Moreover, please remember the good old text (never understood its meaning better than now), "Blessed are the merciful, for they shall obtain mercy."

I was pleased to see A. A. Baldwin step out of his seclusion and throw the gaunlet to Doolittle. It takes courage to attack such a *big* man (in more ways than one), and wouldn't it be fun to see two such lock horns?

Now, that's just what we want in the *Progressive*—display of enough spirit to take your own part, defend any pet theories or plans of manipulation; may be you have been practicing lo, these many years, yet always kept your light under a bushel. Pray don't be so exclusive; usually it does not pay. When you have a good thing, let's hear from you. Let your light shine. It is not necessary to advertise one's troubles—a man having crooked legs should never wear striped pants—but reported failures often serve as a beacon from a lighthouse, to warn others, drifting in the same direction, of rocks, shoals, or other dangers ahead.

All of us want to learn. No man is more to be compassionated than he who is satisfied with himself.

Did you ever! For the past six or seven years there has lived one of the most progressive, intelligent, and successful bee-keepers in the United States, within four miles of the Home of the Honey-bees, and we didn't know it.—E. R. Root, in GLEANINGS (June 15).

And E. R. Root went hundreds of miles to obtain pointers from prominent bee-keepers, with this unknown one at his very door, as it were. Aye, there's the rub! But perhaps in this case he wanted the trip any way—that bicycle had to be tested, you know. However, in the majority of cases our journals have to draw upon the talent of neighboring and distant States, while *plenty* of it can be found *right at home*, if it could only be resurrected from its burialplace.

How many are trying any of the new non-swarming devices, and from how many may we expect to hear at the close of the season? Don't wait to be insisted upon. It isn't exactly manners, and *can't* won't figure; for if the agent, *Will*, is brought into play, the giant Can't usually has to take a seat very far in the rear, or vanish entirely to parts unknown, so that, after a marvelously short period, we are led to exclaim of these very writers.

"True wit is nature to advantage dressed;
What oft was thought, but ne'er so well expressed;
Something whose truth convinced at sight we find,
That gives us back the image of our mind."

I might go on and preach a sermon a yard long, and what results as regards arousing this latent talent? If you "vill," you "*vill*;" but if you "voont," you "*voont*," just like the Dutchman when he avowed, "I vill not be convinshed except by my own convinshun."

Seeing that bee-keepers observe the weather changes so much more attentively than any other class of people, would it not be mutually advantageous for them to occupy the positions at the various meteorological stations?

Pretty cute plan, that of Frank Coverdale (see *Review*) of preventing after-swarming by the use of the Heddon plan and the bee-escape on the otherwise closed entrance of the old hive, whilst it remains near the old stand.

Now is the time the average farmer bee-keeper is after the specialist red hot for "just a few of those patented hives." Wonder if it wouldn't pay to keep a few nailed up for this purpose.

What of this?

If honey is adulterated, charge the blame to the extractor; this has made it possible; it is one of the inventions that never should have been invented.—A. C. Tyrrel, in A. B. J.

Where is the army of extracted-honey producers? To the front! Forward, march! and march right on to this A. C. Tyrrel, and anhihilate him, or, rather, this doctrine of his. If because, along with honey, a thousand and one other things can be adulterated, would the world have been better off had it never known the articles? For a single instance, milk, the first sustenance of man. Bah! Too thin! Too much chalk and water about that kind of reasoning. Give us something pure and unadulterated.

Here is another from "Stray Straws:"

That genial German, C. F. Muth, with his usual persistency, has succeeded, as reported in A. B. J., in getting freight rates on extracted honey the same as on syrup, instead of 40 or 50 per cent higher, as heretofore. I don't know just how much territory is covered by this ruling."

Just like that exasperating Miller. Somebody please be a little more charitable and furnish the very much desired information on this subject.

"The worst spring here in thirty years," heads "Stray Straws." Lots of company, Doctor. Never have we watched so faithfully for the clover bloom. Want, oh so badly! to attend the Chicago meeting October 11, 12, and 13, but that has no effect on the clover. Entirely too shy as to putting in an appearance, either as to date or quantity. Quality also lacking.

"Will bees really build up faster with daily feeding in spring than without it, providing abundant stores are in the hive?"

Don't all speak at once, assuring us you "don't know," but somebody who *does* know please tell.

June 1st GLEANINGS gives Aikin Bros. & Knight's system for the prevention of swarming by transferring every few days the field forces of two colonies from one to the other by inversion, and June 15th the new Bingham smoker, with reversed bellows, wire handle and curved nozzle. These improvements add much to the value of the old Bingham.

E. R. Root speaks of cleating the bellows-boards of the Crane smoker, to prevent warping. It will also add to their durability. The first breakage about a smoker, with us, is the splitting of the bellows-board immediately beneath the fire-box. Of course, this is due to careless handling, but is it always possible to have careful hands?

What's to prevent me having one of those Crane smokers? I am very willing to promise never to use tobacco *again*. But may be he doesn't send out the Crane on those terms.

GLEANINGS has concluded the white of an egg decidedly detrimental to candy for queen-cages. Confectioner's sugar and first-class honey are the best, the honey being the real food-element which sustains life.

Thanks to *American Bee Journal* and GLEANINGS for kind expressions regarding "Wayside Fragments," and please accept an apology right here. Friend York, I hope you, nor any one else, ever entertained the idea that I was so conceited as to imagine that I could walk around in my sleep and gather items of interest for the bee-keeping public.

To my first article I simply signed "Sleepy Head;" but ye editor, probably wanting some high-flown name, and still more probably *not* wanting any sleepy heads among his correspondents (they and progressive being antagonistic) substituted "Somnambulist," and that's the way I became so christened; and as I have borne the cumbersome name this long without serious damage, I live in hopes of surviving.

Friend Root, if the similarity of which you spoke has an existence, then 'twas born out of my admiration of those men's writings, and is highly illustrative of the influence we possess over each other. I sincerely hope they will not feel that it detracts in the least from their honors. But as for the other sentences sounding "like *no one else*," they certainly sound like me.

This kindness from both of you carries me back to childhood's days when we sang,

How sweet to have earned
The blest recollection
Of kindness returned!

And while on this subject, permit me to add that that bee-keeper's benefactor, Bingham, seeing I was still traveling in the same old ruts with a smooth road just alongside, gave me a delicate hint as to where I was, by sending me a wire handle and a detachable curved nozzle for my old-style Bingham smoker. Thanks.

Such hints are duly appreciated; but oh, the dissension such small things can create! You remember that wielder of the Conqueror I told you of. Well, she was determined to decorate her smoker with them, and I—oh, what's the use for a man to say what he wants, when there's a woman around who will have her way? She probably laughs in her sleeves at the advantage she now has over me every time my smoker concludes to fall to pieces, or refuses to do business longer for want of ammunition.

By the way, those suggestions from Marion Miller seem to be good. What is more aggravating than for the cone to fall off, and always just at the time when we most need vigorous work?

There never will come a time when broad fields of knowledge will not be open to every progressive mind, and there never was a time when more opportunities for improvement were offered than are now presented. Error must ultimately be overcome; but as long as it exists, it retards progress and lessens by so much the happiness of the world. Therefore, we all rejoice in the fact that Michigan is to have an experiment apiary, and that it is to be in charge of such competent hands as those of R. L. Taylor. This fact insures success.

Doesn't it seem as if Friend Hutchinson, and through him the *Review* readers, had "struck luck," inasmuch as the reports are to be given to the *Review*? With us, there is but one discordant feeling mixed with this gladness; and that is, a feeling somewhat akin to jealousy that Michigan is to be *so much* more highly favored than her sister States. Accept our congratulations and very best wishes.

What do you think of extracting honey at the rate E. France says he does? (June *Review*.) He goes six to eight miles from home, extracts 2000 to 3000 lbs. per day, one doing the extracting and one the uncapping, and another overseeing nine men keeping every thing running smoothly. I fell in love with E. France years ago; but just think how he works that uncapper! Doesn't it seem as if he should be handed over to some humane society?

In some localities having an abundance of either or both black or honey locust, bees have bred up surprisingly.

I think, with Friend, Pond the danger attending the introduction of queensis greatly over-estimated.

Friend Flanagan, how much I desired to see a date somewhere attached to your article, after reading the first sentence, but failed to find one.

Bro. DornBlaser's eulogy on J. W. Rouse could not be improved, and we all feel a pleasure in knowing it to be well merited.

What about that promise in the beginning? Oh, yes! Au revoir. SOMNAMBULIST.

Naptown, Dreamland.

Whoever you are, Bro. Somnambulist, we extend our right hand of fellowship, and hope you will continue on with your "somnambulating."

I bought one of those Crane smokers of you five or six weeks ago, and have used it constanly ever since. It gives excellent satisfaction. I run my smoker 10 to 12 hours a day, and it is run full blast.

New Smyrna, Fla. A. F. BROWN.

FAX.

One colony with proper attenshun and management will yield more honey and net more money than a dozen left to shift for themselves.

When a queen is ready to gnaw frum the cell,
And gittin' quite ripe, sometimes it is well
To help her climb out; but then, I have seen
A waste in the haste of pullin' too green.

Have tested bottom-boards with and without paint. I think it decidedly the best to give 'em a good primin' coat of white lead—they haint so apt to git warped er kracked.

It don't pay to use unfinished sexshuns left over from last year's krop. The bees will put first-class honey into a fourth-rate receptickle; but kustomers at large won't give a gilt-edged price for the same.

Some one sez that a bee-sting is
Mity good fer the rumatiz;
And I konfess, fer a little bit,
It does make a feller git up and git.

A few days before swarmin' time a layin' queen usually slacks up a little on account of room, and grows sum smaller, so that, when the bees swarm, she frequently gits a hustle on her equal to a vargin queen.

Found a yaller-jackets' nest last week, a small one, made of a kind of paper, and in the form of a hen's egg. The outward shell enclosed a disk of paper cells standin' on a sort of pedunkle. The queen was yaller, and performed 'bout like a Italyun queen. She was four times bigger than the single worker that was with her.

Heard a farmer say one day,
That he 'lowed the bees would pay
On his farm—liked honey so;
It and buckwheat cakes 'd go
Awful nice; but one drawback
Skeered him out—bees had a knack
Of just makin' the fur fly
When he happened to pass by
Whare they wuz; and wouldn't tend
To 'em fer that "bizness end."

ELLERY KRUM.

THOSE OLD BEE-BOOKS.

ANOTHER PEEP AT THE "GOOD OLD TIMES."

We are now through with all of the bee-books printed before 1700, and are ready for the next one, printed in 1749, during the reign of George II. This makes a skip of 70 years after Rusden's book was published, as noticed in our last. In this interval Sir Isaac Newton lived and died. The great impetus given by Newton to the manufacture of lenses put the world ahead with mighty strides in the study of insects. In 1685 Stelluti published a description of the parts of a bee which he had examined through a microscope. In fact, as soon as this instrument became of practical utility a complete revolution in human ideas took place in regard to bees and other insects. The rapidity of this change is strikingly noticeable to one who reads the books of those days in the order of their appearance. If we take that portion of time included between the writing of Butler's Feminine Monarchy, 1609, and the death of Lord Byron, in 1824, we find a succession of English names so numerous and brilliant as to be absolutely astounding. In that list we find Shakespeare, Milton, Newton, Herschel, Bacon, and Davy. England also received a mighty impulse in the arts and sciences when so many people, of the very flower of a nation, were driven from France by the revocation of the Edict of Nantes, in 1685. I allude to the expulsion of the Protestants. Well, why do I mention all this? Simply to account for the wonderful advance in bee-literature at the time of which I write—1750. And as I write those figures I am reminded that Huber—the immortal and glorious Frenchman—was born on the 2d day of July of that year. Besides, it is well, at times, to take a brief view of the history of our ancestors, and see the difficulties which they encountered and obstacles which they surmounted. The cobwebs of ages hung over England in the time of Butler, in matters which were purely scientific. Even the rotundity of this globe was not then universally accepted as the true theory. I believe, furthermore, that bee culture will be none the less attractive when we know its history.

The book in question is entitled "The True Amazons; or, the Monarchy of Bees." It was printed in that celebrated hot-bed of literature, Paternoster Row, London, in 1749. By the way, I wish some of our English readers would tell us something about that street as it is to-day. The author's name is Joseph Warder, a physician of Croydon. Somebody has written on the flyleaf, "Very rare and curious." That is true. The book commands respect as soon as one has read a page. The part devoted to bees contains 163 pages, nearly the size of this. It is dedicated to the queen, probably on account of the fact that Warder must have despised such a contemptible man as George II. is known to have been. When this royal figurehead heard of the death of his father, George I., he exclaimed, "Dat is one pig lie!" I suspect Warder feared the king would say that of this book, especially where the queen is spoken of as a female. What England owes to her queens for what they have done that was good, and for the evil they have prevented, is ahead of my arithmetic.

In Rusden's book, mentioned in my former article, he makes out that all bees are fertilized singly by the *rex apum* (king bee). Mr. Warder himself speaks of the workers as being true females, and of laying eggs in the spring. He demonstrates by actual dissection that the drone is a male, and that its use, aside from paternity, is to keep the eggs warm by sitting on them! The use of the queen, in his opinion, was simply to give orders and be a lady. He makes no mention of her egg-laying propensities. He speaks of the loyalty of the bees toward the queen, and tries to shame the British for their intense dislike of George II. by telling them they should be as loyal as the bees. What George ought to have been as a king is not mentioned. He says that many of the absurdities which Mr. Rusden "imposed" on the world were the result of following the "silver-tongued Virgil," as he calls him. That's right. Virgil was a perfect ignoramus in regard to the habits of the bees. Our author says of him: "Though Virgil was a great poet, in treating of bees he writes more like a poet than an experienced bee-master." Again: "Honey putrefieth not: but by its conservative virtue doth prevent other bodies from putrefaction." This property of honey was well known to the Egyptians, who used it, we are told, in embalming. Again, Mr. Warder says: "Eggs are laid only in the middle cells, while those all around the hive are reserved for honey—nature, or, rather, the God of nature, having taught the bees that, if they should cast their eggs near the outside of the hive or box, there would not heat sufficient come to hatch them." That sounds as if frames were not used. Mr. Warder is opposed to the killing of drones, and says it is as foolish as for a man having ten rams and a thousand ewes to kill the rams in order to increase the flock. That would be a more forci-

ble illustration if the male sheep made a practice of sitting on spring lambs to "keep them warm."

The enemies of the bee are mentioned as the moth, mice, earwigs, hornets, and wasps. The part on bees winds up with very "full" directions on how to make "old budge" out of honey. They called it mead, and equal to the best Spanish wines.

The second part of the book consists of 200 pages in refutation of the papal dogma that communion bread is the actual body of Christ and not symbolical of it. The author is Edward Lewis. He handles the subject in a masterly way.

The third part of the book is "Directions to the Clergy of London, in 1724. Amen Corner, London, 1738." Aside from its special bearing, I wish that those who do so much toward rendering the Bible unattractive by their wretched reading of it could read what the author, the Lord Bishop of London, says in regard to reading sacred words. This one book, or three in one, is certainly one of the most unique and interesting I have ever examined. W. P. R.

Medina, O., July 24.

HEADS OF GRAIN FROM DIFFERENT FIELDS.

THREE COLONIES 15 YEARS OLD.

I have three colonies that are 15 years old. They are in two-story L. hives, 20 frames. There has not been a frame moved in those hives for that length of time. They winter in a shed, packed in straw and chaff, with sealed covers, air-tight. I have had as many as 160 lbs. of comb honey from each in a good year, and not less than 30. F. P. Clark.

Parkman, Ohio, July 9.

AN IMPROVEMENT ON THE HEDDON METHOD OF TRANSFERRING.

Friend Root:—I notice in several late numbers of Gleanings references to the Heddon method of transferring. I wonder that you should have overlooked or forgotten that there is a still better method, which allows the whole transferred colony to remain together, while the brood is hatching out of the old combs. It was published in the *American Bee Journal* of 1891, page 386. I tried it that year with perfect success. You may remember that I got some all-zinc perforated honey-boards from you, which I used for this purpose. Others, here, have borrowed my honey-boards and used them for this way of transferring.

Wm. Muth-Rasmussen.

Independence, Cal., July 14.

HOW DID THE QUEEN GET OUT?

I am reading your books on bee culture, and like them very much. Now, I wish to know if I haven't discovered something new. I had a queen-cell about to hatch out. It was a novelty to me, so I watched it every day. On Saturday it had not hatched. On Sunday it was hatched out, but I did not find the queen. On Monday I looked again, and found that the queen-cell was all nicely sealed up again. I looked for and found the queen. I then cut out the queen-cell and cut it open, and out popped a worker-bee and flew directly to the hive. How came the worker in the cell, and sealed up after it had once been occupied by a queen? Did you ever hear of such a thing before?

Delhi, Wis. C. F. Appley.

[This sort of thing has been mentioned before. You will find it spoken of in the A B C of Bee Culture, under the head of "Queen-rearing." The fact was, the young queen hatched out, and, as young queens often do, she gnawed the cap of the cell nearly off, leaving it hinged on one side. She crawled out, and in the mean time the worker-bee crawled in; the cap fell back into position, and fitted so tightly that a casual observer would never think it had been opened. But the bees go on and seal up the cell tight. If you observe closely those cells from which queens have just emerged you will find that the cap resembles somewhat the cover of a coffee-pot, hinged on one little narrow edge. Sometimes these caps are gnawed entirely off, but oftener not.]

A MESSAGE FROM THE STARVING IN INDIA.

In our issue for Aug. 1, 1892, we spoke of starvation in India, and gave a picture of some of the sufferers. Contributions came in to a moderate amount—nearly $35.00—and that amount, together with our own, was forwarded to Mr. Van Allen, and here comes his report:

To A. I. Root, Esq.:—I have just now received the inclosed note from one of our native pastors, to whom I had sent $3.00 of the money which you were so good as to send me for the relief of those suffering from famine in our district. I send it to you, as I know that it will be an item of perhaps considerable interest. The money which you, and others with you, kindly sent me, has principally been expended in buying rice, and giving out to our poorer native Christians on Sunday, in our churches, at the close of worship. Frank Van Allen, M. D.,
Medical Missionary, Madura, So. India.

Below is the letter from the native pastor, mentioned above:

Rev. and Dear Sir:—The people who were fed by the money which you were good enough to send to me, thank you very much for your kindness and care toward them. For the ten rupees I bought 60 measures of rice, which gave one good meal for 240 people. Some of those that received help said that Christianity is the best religion because it cares for others. Yours obediently, Y. J. Taylor,
Native Pastor, Aruppukotti Station,
Madura District, South India.

The letter above refers to only $3.00 of this amount, and that sum gave a good meal to 240 people—just a cent and a quarter a meal. Now, does it not seem, dear friends, that, with wheat at only 50 or 60 c. a bushel, the United States of America ought to be able to come at least pretty near stopping absolute starvation anywhere on the face of the earth. Of course, we have got to have railways and other means of travel to carry supplies speedily to the suffering ones of the earth; and it just now occurs to me that the modern wheel may play a very important part in this labor of love; and I think I should enjoy ever so much more carrying wheat to starving people, on a wheel, than even running the mail up to the postoffice so as to give our patrons prompt returns and responses. May God bless the efforts, and help us in seeing to it that nobody is starving to death in this whole wide world of ours.

REPORTS ENCOURAGING.

Bees are booming. F. F. Main.
Newton Falls, O., July 5.

Bees are doing well on basswood.
Hastings, Mich., July 9. F. S. Clarke.

My bees are fairly piling up the honey this year. Some years ago I ordered some shipping-cases, but never had any use for them until now. Wm. Ballantine.

Mansfield, O., July 1.

My bees will average over 125 lbs. of comb honey this year. How is that?
Syracuse, N. Y., July 7. H. E. HESSLER.

The honey crop in this section, so far this year, is immense. S. F. NEWMAN.
Norwalk, O., July 7.

I have taken 96 one-pound sections from No. 46, and still it comes. T. M. MOLTZ.
West Fairview, Pa., July 10.

Bees are booming here. One hive fills 6 crates; 7 five; 7 four; all white clover and some linn. I shall have two tons this year.
Montpelier, Ind., July 12. W. B. WEST.

The bee-keeper should wear a broad smile, and be thankful this year. Bees are working in second and some in third tier of sections. Basswood just begins to open here with us.
Parkman, O., July 8. F. P. CLARK.

I never saw white clover blossomed more profusely, and there is more honey in it than there has been for four years. Basswood is budded very full; but being disappointed the last three years, I dare not let my hopes run too high until I see what we get.
E. R. A. BRAINARD.
Postville, Iowa, July 9.

OURSELVES AND OUR NEIGHBORS.

For the preaching of the cross is to them that perish, foolishness: but unto us which are saved, it is the power of God.—I. COR. 1:18.

Mr. A. I. Root:—On page 488, June 15, you quote your proof-reader as saying: "Christianity is accepted and taught in our colleges, where the highest order of intelligence and virtue prevails." To which you add: "And, of course, our colleges teach and advise prayer to God. If the highest order of intelligence in the world accepts prayer as a real power in this world, what shall we say?" This seems as much as to say, that, if a number of college professors are Christians, and teach Christian doctrine, then, of course, Christianity must be a truth. (I say "a number," for it is certain that not all the learned men in the world are Christians, but that many of the greatest thinkers that ever lived and are now living have been and are unbelievers.) Following this line of argument one could say that, as the wise men of ancient Greece and Rome, in which countries "the highest order of intelligence" once prevailed, believed in and taught their respective pagan religions, then, of course, they must have been truths.

Again, on page 489, you say, in reply to Mr. R. H. Randall, that God originally made the Devil a good being, and that he made himself bad. Now, I should like to ask you a question: Is your God all-knowing? If he is, then he knew, when he created the Devil, exactly how he would turn out. If he did not know, and if he is almighty, why did he not kill the Devil when he found out what a lot of mischief he could do? Yours for truth,—
Yorktown, Tex., June 28. ROBT. WESTPHAL.

Friend W., in regard to the first part of your argument, I would suggest that the intelligence of the present day is at least a little in advance of that of ancient Greece and Rome, especially when we are told, it was "easier to find a god in Athens than a man." This age stands on the shoulders of all preceding ages, and hence can see farther. Surely you would not think of comparing the present age with the age of idolatry. Again, the fruits of the Christian religion are all round about us. I am tempted to drop this part of your letter by saying, "By their fruits ye shall know them." I will, however, cite one illustration here.

About the year 1820 a youth of 18 or 19 was passing along through the streets of London. He was a remarkably bright mechanic, and was employed at good wages in a factory where wood and iron work was carried on. In the evening, after his work was over, it was his custom to find recreation in various places of amusement. He had learned to drink, or was learning to drink, and could play different games of chance. He was on his way to a place of amusement, something like the beer-gardens of the present day. A Christian lady with whom he was well acquainted met him and urged him to go with her to an evening meeting. He did not like to give up the enjoyment he had planned for the evening, so he objected. She urged, and finally implored him to go with her just once. Out of good will to her, but without any idea that he should care for the religious meeting at all, he consented to go. The meeting was led by a returned missionary. In fact, he was one of the pioneers in the work of carrying Christianity and civilization to the cannibals of the South Sea islands. Before young Williams knew it (for it was indeed John Williams himself), his whole mind and being were absorbed by an account of the great work that needed somebody to give his life to it. Before the meeting closed, his mind was made up. That one little circumstance of yielding to the lady's entreaties was the turning-point in his whole life. He never visited another drinking and gambling place in his life. He went to work quietly and patiently to fit himself to go to the South Sea islands as a missionary. I wish I had space here to tell you of his subsequent history, which reads more like strange fiction than stern reality. In a year or two he determined to start out. His employers offered him big wages if he would stay, as he was an exceedingly valuable man. But big pay was to him of no consequence. He had enlisted under Christ Jesus, who has said, "Inasmuch as ye did it unto one of the least of these my brethren, ye did it unto me." Let me give you a glimpse of what he did.

He rejected the advice given him, to educate himself for learning the language. He thought it would take too much time. He had made up his mind that he could learn the language of the people by a short cut of his own, and he did it. He depended largely upon his wonderful skill in mechanics to make friends with the natives, and so he learned their language. Almost as soon as he got into the island he became a favorite. A crowd was continually following him, and looking on, as he exhibited his marvels of skill in building houses, boats, machinery, and every thing that was needed for their comfort and civilization. After he had been on the island only ten months he had learned their language so well he could preach a sermon to them in their own tongue. Let me tell you what more he did in just one year's time among savages, cannibals, and pagans. He celebrated the anniversary of his landing by having a Sunday-school picnic. At this picnic the children dressed as children had never been dressed before on that island. They carried banners, and on these banners were inscribed, in their own language, "We are the children who would have been put to death in our infancy had it not been for the gospel of Christ Jesus, which has come to us." At this point in the ceremonies the king himself arose, and begged permission to speak. It was an interruption to the program, but he said he must speak. With tears in his eyes he said something like this: "Dear friends, what the children tell you is true. I am now a childless old man; but God has, in time past, given me nineteen children in all. May God forgive me that they have been all put to death, as the

children have told you." He sat down with streaming eyes, and groans and tears convulsed the whole audience. What he said was indeed true.

Now, before I tell you more about John Williams, let me say to you, friend W., that it was the gospel of Christ Jesus that wrought that wonderful change in just one year's time in that island of Raiatea. Has any other religion, or what you may call religion, done any similar work? Has infidelity ever turned a single young man from gambling and drink, to a work like that? You need not answer *me.* Answer the question, each one of you, before God and in your own hearts. Do you know any thing like it? Let me now go on a little with my story.

As soon as young Williams had got the work established in this island—yes, even *before* it was established, he put the work into the hands of native workers, and pushed on to the next island and then to the next. The people embraced the new faith in a way that seemed almost miraculous. Instead of putting their children to death, and the old people too, they clothed and fed and cared for them as Christians do everywhere; and they were soon filled with a wondrous zeal to go and assist in the work of their leader in carrying the Bible and Christianity to neighboring islands.

Let me give you a little glimpse of Williams' discouragements. Somebody became envious of him, and the ship that had been at his disposal was withdrawn. He stated the matter to his native helpers, and told them that, with their help, he would build another ship right there on that island. The first thing he needed was tools; and he must have a forge and blacksmith's bellows. To make the bellows they killed the few goats that had been brought on to the island by a missionary ship; but during the night the rats, which infested the island in swarms, ate up his bellows—that is, the leather part. Then he went to work and made a bellows with a board moving in a wooden box. He made his tools, cut down the trees, hewed them into shape, forged the iron work, making his own nails and bolts, and actually completed a sailing-vessel inside of a year, that did missionary work for several years afterward. The man's energy, industry, and wonderful inventive powers, seemed almost miraculous. The kings of many of the islands were, of course, hostile, and forbade him to land or teach. In such a case his only resource was prayer; and in answer to prayer, these very savages and *pagan kings* became "clothed and in their right minds." They gave up cannibalism, and sat at his feet and were taught as little children, the people of their islands following them. Some of you may be tempted to believe these statements to be untrue. They are the whole facts, however, right in print, and are as well substantiated as the history of the Fourth of July in our own country. Since Williams' time, wondrous strides have been made in converting the inhabitants of the islands of the sea until cannibalism, infanticide, and other like hideous crimes, are now hardly known on the face of the earth. Every reader of Gleanings knows more or less of this work. The man who disputes the result of Christian work is about on a par with the man who would tell the child that the Fourth of July does not mean any thing, and that the stories about our independence are only fables with no truth in them.

Now in regard to your last point. I do not know whether you know it or not; but you are striking on one of the most difficult points for the finite human mind to grasp that has ever troubled the world. I am not a theological student; in fact, I do not exactly know what our doctors of divinity would say in regard to this matter. I am quite sure, however, they will tell you that this is only one of the many points which the human intellect seems inadequate to grasp. Suppose you had said to me, "Mr. Root, how far does space extend? Is there any limit to the number of constellations of the heavenly bodies that fill out space? If there is a limit, what comes next? how thick is that, and how far does it extend, etc.?" I can not answer; you can not answer; no living being can answer. We almost reject the idea that there is no end to space; and, in fact, I believe I have read somewhere that the latest investigations in astronomy show that suns and stars and worlds do *not* go on for *ever* and *ever;* that the best telescopes we have even now have probably caught a glimpse of all the stars there are in the universe. Well, that is a little comforting; but the comfort is short-lived, however, for the average Yankee wants to know what they *do* have when they have stopped having *stars;* and how far off is it through "nothingness" until we come to *another* plantation? Oh dear me! it makes one's head swim.

Well, now, the question you propound is, in some respects, a parallel one; viz., "How or why did *sin* come into the world?" And then, again, in regard to foreknowledge—*does* God know beforehand exactly how every thing will turn out? Now I will *try* to answer your questions. Of course, it will tax my intelligence and understanding clear to their fullest limit. As we grow older, certain questions seem to get a little clearer. I think I can compass some things now that I could not a few years ago. In the first place, does God know all the future? In one sense, I believe he does. But we may push this very idea to an extent where it becomes foolish and harmful. You have all heard of the same sort of reasoning, I presume, something like this: If God knows just how a thing will turn out, then, of course, it will turn out that way and no other. And then somebody stupidly adds, "What *is* to be *will* be, and it does not make any difference what we do; it will turn out all the same, any way." Now, this latter is about as stupid and foolish as any thing can well be in this world of ours. Why, just think of it! A farmer might say, "God knows whether I am to have a crop or not. It is decreed beforehand, from the foundation of the world; and if it is decreed that I am not to raise any thing, it will not make a bit of difference whether I work hard or not; so I might as well let the thing go." Such a man is crazy. His place is in the asylum; and if he does not get there, he will get to the poorhouse eventually. But I have actually heard men blame God the Father and God the Creator for their bad luck by just this line of argument. I once heard my good mother say she did not believe that God knew *every* thing beforehand. When I was about to lift up my hands in astonishment, however, she added, "At least, I do not believe he has any kind of foreknowledge that cuts off human *free will* and human *responsibility.*" You see, her *addition* to her first remark made her in line with the orthodox people of the world.

Friend W., the Devil is a free agent, like the rest of us. From the beginning he has been honored with liberty to do *good* or to do *bad,* as he chooses. God has seen fit to permit this kind of liberty, just as he has seen fit to give you and me liberty. If you feel like finding fault because God gives so much liberty, let us suppose he had created human beings that had not the power of sinning. I do not know just how he could have done it unless we were circumscribed or in bonds. A locomotive can not

run off across the country, because it is confined to a certain line by an iron track. The iron track is a good thing, but neither you nor I would like to be circumscribed in just that way. We should like to ramble over the whole universe. By his permission to ramble he places a responsibility upon us. We have to take care of ourselves and our bodies. If we were slaves in bondage, and had a master or a guardian to look after us, and see that we did not get into mischief, we might be spared from sin and crime; but our liberty—in fact, the very liberty we boast so much of in our United States—would be cut off. We like liberty. It is a compliment to humanity, that God has seen fit to give us liberty. But with this liberty comes the possibility of sin and crime. When helpless innocent women and children are called upon to suffer, it seems to us to be awful, and we are inclined to ask why God made humanity in such a way that the helpless and innocent are so often called upon to suffer.

A neighbor's little girl once suffered severely with the earache. Once, when the pain let up a little, she asked, "Mamma, do little girls ever die of the earache?" For many days and nights she suffered the most excruciating pain. Why does God permit such things? I can not tell. I only know that the world seems to be fashioned in this manner. The last word on the lips of this little girl was the little prayer that her mother taught her to say just before she went to sleep at night. She might have reasoned, after a childish fashion, that God had been so very cruel and hard toward her she would not say her prayer any more; but is it not far better—oh! a thousand times better—hat no thought ever entered her childish heart that God *could* do any wrong, or make a mistake?

It may be hard for the human intellect to comprehend or compass the thought of *God's foreknowledge* and, at the same time, *free human agency*. Yet common sense tells us—yes, it tells even a child—that we are free to do right or wrong. If we do wrong, the consequences fall upon our heads; and it is through trial and discipline that we learn wisdom. In our experiment stations they have trial-grounds where they test things. In our grounds at Columbus, O., the soil on the rich river-bottom was *too* good for an experiment station. The farmers all over our State complained that the tests were not fair; and finally the experiment station was moved so that a part of it was on some of the hardest and poorest clay ground in the State of Ohio. The old farmers wanted our college boys to try their hands and make experiments on some of the poor and unpromising soil of the State. They were right.

Now, if God had decided to have this world of ours a trial-ground to let us fight our way through, and thus bring out the best there is in all of us, could he have planned it very much better? I have told you about a time when our Medina schools were so very bad that Mrs. Root questioned the wisdom of letting our boy go to school. Should we keep him at home? By no manner of means. A boy kept out of school would be like a potato grown in the dark. Let the boy *go*. But talk to him; encourage him, and explain to him the evils he must encounter, and *fortify* him so that he will come out unharmed; then go to work and help the teachers. Exhort, entreat, and *fight*, if nothing but fighting will do the work, until you fight the filth, obscenity, and blasphemy *out* of the school. Now, if you will promise not to think I am boasting, I will tell you what the superintendent of our schools said a few days ago. He asked me if I remembered, when I was on the school-board, of going through the schools and exhorting the boys on the subject of profanity, obscenity, cigarette-smoking, etc. I told him I remembered it quite well. "Well," said he, "there has been a better state of affairs in our schools from that day to this in consequence of the plain talk you gave them." I remember that I was full of business at the time, and felt as if I could not stop my work; and in my want of faith I feared it would not do any good anyhow. Now, I throw this out as a suggestion. If your schools get in just such shape, remember what one individual may do single-handed in encountering evils of this kind. Let the work be followed up by half a dozen good men and women, and it will help the rising generation.

Now, friend W., which is wiser—to throw the blame on God for creating human beings, knowing that they will bring evil into the world, or to open your eyes, accept the state of affairs, and go to work with energy and faith to bring good out of evil! Again, God surely knows what a lot of mischief Satan has done. Now, will you think me reckless when I suggest that Satan also does good? The Bible tells us that God shall so manage things and events that the wrath of man shall *praise* him. Now, right here is another chance for infidels to put in and find fault. You may say, "Well, if bad people do good in a community, I think I will be bad a while. I shall rather enjoy it; and if I do good by the means, what is the harm?" We are never to do evil that good may come of it. Jesus once told his disciples, "It must needs be that offenses come; but woe to that man by whom they come." Wickedness is coming; it will continue to come; and we are going to be strong and good, courageous and brave, *because* we have to meet wickedness and sin. But this is no excuse at all for the man who does wickedly; for Christ himself has said, "Woe to that man," etc. The children of a drunken father often develop great powers of mind, perhaps somewhat by the trials that are thrown upon them in early life. The indignities they suffered made them fierce battlers against the evils of intemperance; but no credit to the drunken father who subjected them to these trials. We can not tell how far space or how far the planetary system extends; but for all that it behooves us to keep making better telescopes, and to keep searching the starry vault above.

In the same line, we can not tell exactly *why* sin is in the word; but it *is* here, in your neighborhood, in mine; in your *heart*, and *mine*. Shall we lay the blame on God, and say that he need not have placed these possibilities and evil appetites within us? Then we should be on a par with the farmer who sits down and says, "There is no use in trying;" or one who says, "God did not make things right, and I am not going to exert myself against such odds as there are against me." You see, our text sums it all up: "For the preaching of the cross is to them that perish, foolishness." It is to them that *perish*, you notice, and to them that perish because they would not try; but on the other hand, dear brother (I call you such because you sign yourself "Yours for the truth"), "unto us which are saved, it is the power of God." The whole thing lies before us. Sin is here, and Satan is here. We can follow sin and Satan, if we choose; but these very things that might discourage us—these very things that pull us down—are a mountain of *strength* to the one who is loyal to his God and loyal to himself. These very things may be a cause of *rejoicing* to him who goes forward in faith believing, to him who is loyal to his country and to his God; to him who sees a thousand things in nature on the earth beneath, and in

the starry vault above, and cause for thanksgiving and praise instead of cause for lamentation and complaint, and sloth and inaction. Now, dear brother, you may be against me in *one* sense; but if you are for the truth, as you say, we are side by side in *another* sense. You certainly would lend a hand and rejoice at the hope of helping in a work like the one mentioned by John Williams. By the way, I forgot to say that he finally *died* a martyr. He was killed by the cannibals on one of those very islands. He gave his *life* for the ignorant savages. And may God help us that we too may be ready to give our lives when the good of humanity—of poor forsaken humanity—shall demand it.

NOTES OF TRAVEL.

NOTES OF TRAVEL ON THE WHEEL.

It was just getting dusk when I reached friend Crawford's. Somebody was swinging a little girl in the front yard. It was too dark to recognize anybody; but as soon as I heard friend Crawford's voice I felt quite at home. The reason why I did not know just where he lived was because he has recently changed his residence. Like myself he decided that there are so many advantages to the grower of strawberry-plants on sandy soil he actually sold out his home, let the underdraining go, and the heavy manuring, in order that he might start a new place on sandy soil. Instead of moving my plant-beds to a sandy region, I bring in the lake-shore sand by the carload. The one who grows strawberry-plants for sale must be prepared to take up plants in the spring just as soon as frost is out of the ground. Well, if you have tried this kind of work in a stiff clay, such as we have here at Medina, you probably know something about it. Think of being stuck in the mud when it is all you can do to lift your feet—said feet being incased in a clod of mud about the size of an ordinary coalhod. It is not altogether the disagreeable feeling of having so much on your feet, but it is ruinous to walk through the nice rows of strawberries when the soil is in just that condition. We avoid it by having our paths between the plant-beds covered with cinders, and by using a good deal of sand mixed with the soil of the bed. Friend Crawford, perhaps, made a shorter cut by starting a new home.

Mrs. C. excused herself for not getting up to welcome an old friend because she had her lap full of old letter envelopes. Shall I tell you what she was doing with them? Why, she was cutting out the stamps from the accumulation of letters of years past. Somebody had offered something like 15 cents a thousand for the canceled stamps. Just a word in regard to this stamp-traffic. It may be all right. The good women who collect them and use the money for charitable or other purposes are *certainly* right; but it keeps occurring to me that I remember of reading in the *Scientific American*, some years ago, that it seemed well nigh impossible to stop the business of fixing these stamps up to be passed off as new ones. Again and again several considerable establishments have been broken up by the police; for just as soon as the government hunted up a new kind of ink, these counterfeiters—if that is their name—would find some chemical that would perfectly obliterate the cancel, and the stamps were cleaned by certain chemicals, gummed over, and peddled out. Making collections of rare, curious, or foreign stamps, is, of course, a legitimate business; but what can honest people want of thousands and tens of thousands of ordinary postage-stamps? I hope my good friend Mrs. Crawford will not think that I mean to find any fault with her work. The same kind of work is being done right here in Medina, and even in my own home; and one of our office girls, who is a member of the King's Daughters, received $7.50 for ten thousand stamps, saved out of our own castaway envelopes.

Another little gem of a sleeping-room was placed at my disposal. As I thanked God that night for the mercies of the day, a feeling kept coming over me that I did not deserve such good friends and such dainty accommodations; but it gives me a thrill of pleasure to know that there are so many such pleasant homes in this land of ours.

I was up and out among the strawberry-plants before anybody else. In fact, I had inspected every thing in the line of strawberries and gladioluses almost before friend Crawford made his appearance. We discussed the matter of sending out plants that had been kept in the cellar or somewhere else, to be ready for shipment; and friend C. entirely agreed with me, that no plants should be sent out except those in full life and vigor, taken right from the open ground. Like the rest of us, he sometimes runs short of certain varieties; and to get along he buys of those who have a surplus; but before such plants are sent to customers he heels them in in his nice rich sandy soil. A little furrow is made, perhaps two or three inches deep. The plants are laid in this furrow, two or three inches apart, with the roots properly spread out. Then the soil is pulled over them in such a way as to make another furrow while you close up the first. Said furrows ought to be five or six inches apart. The plants are all heeled in in this way, watered and shaded if the weather is hot, until they have made new white roots. He pulled some up just to show me how he wanted the roots of his plants to look before he sent them out. I tell you, friends, it is not luck and chance that have given friend Crawford such a trade as he has in new varieties of strawberries. At this juncture I asked him the question why it was that he advertised plants nowadays only by the dozens or hundreds.

"Why, Mr. Root, I can not afford to grow plants, and put up them at the prices they are advertised in the various papers. Of late there seems to be a sort of agreement—at least among a certain class of strawberry-plant growers—at about $2.00 or $2.50 per 1000. Now, I can not sell plants, put up as I think they should be, for any such price as that."

I told him I heartily agreed with him, and that, although our prices had been for years 75 cents per 100 or $6.00 per 1000, our trade was all the time increasing; and during the past season we have had more orders for plants by the thousand than we could possibly fill. At the same time, we have been so pressed with orders that we have sent out a good many plants that were not what they ought to have been. I go over this matter rather freely here in print, because a good many readers of GLEANINGS advertise and sell strawberry-plants, and a much larger number purchase plants almost every spring and fall; but the demand is so much larger than the supply, that the price will probably be high during the coming season.

Friend Crawford has been for years an originator of new varieties of strawberries. If I am correct, he succeeds in getting improved varieties, very much as friend Livingston gets his new varieties of tomatoes. He plants a great lot of seeds. These seeds are, I believe,

selected from the best varieties of strawberries known. Each little plant is given a place, and carefully watched until it bears fruit. Then the fruit is examined critically. Nowadays, while we have so many extra nice strawberries, it is a pretty hard matter to get hold of one *really valuable*. Perhaps not one of the new plants in ten thousand is worth fussing with; and it may also be true that a really valuable berry is sometimes dropped and passed by for many years before its good qualities are recognized. Friend Crawford originated the Sterling strawberry in just this way, a good many years ago. He took samples of it to the city of Cleveland, and submitted them to men who make a business of buying new varieties. Somebody who was not quite at home in that business was very much taken up with the Sterling, and paid friend Crawford something like a thousand dollars or two for his entire stock of plants of that variety. The owner, however, did not understand introducing a new berry. He advertised it in the *American Agriculturist* and some of the other papers; but people did not seem to know him very well, and he did not have a recommendation from anybody that the berry folks did know; therefore he never got any thing, scarcely, for the Sterling strawberries. A good many people who probably thought a strawberry must be sweet to be good, pronounced this Sterling too acid, and but little attention was paid to it until friend Terry called attention to the fact that it was a strong grower, late enough to be usually safe from the frost, excellent color, nice shape, and of a beautiful flavor after it had been sweetened sufficiently. He also found it was very firm, hard berry, and would bear shipment well; and just now a great many people are beginning to call for a berry that is tart, like the wild strawberries that we used to gather in our childhood days; and, all together, the Sterling, after all these years of neglect, promises to be a standard berry. Very likely friend Crawford saw all its good qualities when it was his pet and the new plant of his creation—that is, so far as we ever create any thing in this line; and it must be refreshing to him to see it brought forth again, after it was so many years dropped and passed by.

Now, after I had been all over the grounds, and had had a long chat in regard to the new berries, it was not near the usual breakfast time; in fact, I rather think the people in the neighborhood were not yet up; but I felt in just the mood for a spin on my wheel before breakfast; and friend Crawford showed that he, like friend Terry, knew exactly how to make a guest feel pleasant and happy. He said that, if I really preferred to start out before breakfast, to do so by all means, although it seemed a little uncourteous to send off a visitor without any refreshment. How I did enjoy that wheel-ride from Cuyahoga Falls to Akron, in the early morning! Some of the grandest scenery in the State of Ohio is right along here where the Cuyahoga River cuts itself a path through the sandstone, sometimes 200 feet below the surface of the ground. Just as the clerks were hanging out their pretty little card, "Breakfast is now ready," at that same "City Restaurant" in Akron, I sat down and informed them that I wanted some strawberries. The waiter replied they hadn't any so early in the morning. Said I, "Look here, my friend, I just passed some beautiful strawberries right above here. Will you please get some, and charge me what you think proper for the trouble?"

Pretty soon she came back, looking a little bit undecided.

"Did you wish the *whole quart* served up for your breakfast?"

I assured her that I wanted the whole quart. I presume she had not read friend Terry's strawberry book. But, wasn't that a nice breakfast!

When I started out with my wheel, however, it began to rain. I was so determined to go on, that, for a time, I thought I would stick to the wheel anyhow. But I soon decided that prudence was the better part of valor, and, with a long-drawn sigh as I gave my wheel to the baggagemaster on the train, I came home on the cars. When it slacked up and did not rain much, I felt a good deal disappointed. Just think of comparing a wheel-ride of 20 miles to taking it on the cars, where you have to sit still on a cushioned seat, and you *yourself* are no "part and parcel" of the motive power that sends you spinning across the country.

HIGH-PRESSURE GARDENING.

BY A. I. ROOT.

PULVERIZING THE SOIL.

How much has been said in regard to this matter, especially by the manufacturers of the various farming-tools for pulverizing the soil! The manufacturers of the Acme harrows have frequently told us that "tillage is manure." I do not believe, however, that the truth has been half told in this direction. However, we want to be consistent, and use reason. Since Terry and others have said so much about working the ground until it is fine and soft, there have been some — myself among the number — who have carried to an extreme, under certain conditions, this matter of continual working. During the wet springs we have had of late, I have several times, I am well satisfied, worked the ground when it was too damp to pulverize nicely, in a way that made it worse instead of better; that is, the tramping of the horses and the weight of the heavy implements compacted the soil more than it made it light. The disk and cutaway harrows have been a help in this direction. But there are times when even these tools do more harm than good. When the soil is dry *enough*, however, the more you harrow it and roll it, the better. A great many times, after we have got our ground in perfect order, a long heavy rain comes on that compacts it so it is almost as if it had not been worked at all. I have told you how my relative, Mr. Wilbur Fenn, of Tallmadge, O., managed in such an event. He waited till the ground was dry enough, and then plowed and harrowed it all over again. One year I had a piece planted to melons that had been started all right; but the rains were so heavy that the ground was literally covered with water, and, of course, the crop threatened to be a failure. I saved it by taking a nice steel garden-rake, just to my notion, and digging away the dirt around the hills until I could see the white roots of the plants. In fact, I dug so close and so deep that some of the plants wilted a little after this severe treatment. Then I made the ground fine and soft, and pulled up a "dust blanket," heaping it up in a hill about a yard wide, all around each hill of melons. I have done the same thing with tomatoes and other plants. When Terry raised almost a carload of Freeman potatoes from one barrel of seed, he said, in telling about it, that they did an enormous amount of work on the potatoes. During one of my recent visits I said to him:

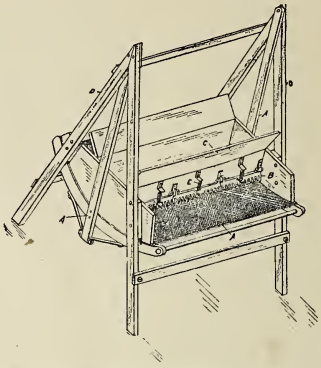
"Friend Terry, I want to know what *sort* of work it was that you gave those potatoes with the divided eyes, that produced such a tremen-

dous crop." And then I told him my experiment with melons and tomatoes, and added, "Now, was not this work you speak of something similar to what I did with my melons? With suitable tools you made the ground fine and soft clear down around the roots of those little feeble divided potato-eyes?"

"Yes, Mr. Root, that is just exactly what we did; and it cost so much because it was hand work. With the new Iron Age and Planet cultivators, we aim to do the same thing as nearly as possible by horse power."

Well, during the present season, with the two cultivators mentioned, the dirt has been kept finer and softer on our grounds than ever before. In fact, Mrs. Root objects to going through the lots to see the crops, because the ground is so soft that her feet sink at every step, and it is very hard work walking over the cultivated ground. Our "Palmer" raspberries were given the same treatment as the potatoes, and there we have had the finest yield of black-cap raspberries I ever saw in my life. The recent drouth seemed to have but little or no effect on the fruit at all. In rows where this constant cultivation had been omitted, the soil became as hard as a brick, and opened in great fissures. Right through my field of rye adjoining, there are now cracks big enough to drop in a hen's egg. We had a magnificent crop of rye, notwithstanding; but I mention it to show you what a contrast there is between that and land adjoining the potatoes, that had no cultivation at all. The potatoes stood the drouth grandly, and just now we have had two pretty good showers right on that soft ground. It was just fun to see how that mellow earth took up the water just as a sponge does. Not a drop of it ran away; but on the rye-field the water filled those big cracks, and then ran off into the road.

So much for fining up the soil for farm crops. Now, we want to do the same thing for plants in our plant-beds. For many years I have been running the ground on our plant-beds through the sieve that has been pictured in these pages, and is now to be seen in the tomato-book. A good many times I have speculated on a machine that could be operated by simply turning a crank, or, better still, pulled by a team of horses. The machine should be something like the Hoover potato-digger, but it should be so arranged as to put all the stones, rubbish, and lumps of dirt in the bottom, and the fine soil on top. You may take almost any ground — the poorest in the world — and if you will sift it so as to have the fine soft particles on top, and all the rubbish and coarse lumps underneath, you can get a crop providing you have water. If I could have my way I would have the surface just like sifted road dust; have it so that, when you pass your fingers through it, it will seem almost like wheat flour or middlings; and I have wondered why greenhouse-men did not have some such arrangement to work up their fine manure, and mingle it most thoroughly all through the soil. For instance, sift your dirt first as I have recommended, and then get some old fine manure and sift that. Now pass the manure and dirt together through the sieve, taking first a shovelful of one and then a shovelful of the other: thus you will get a combination that will do wonders. If you have some old decayed sods, so well decomposed that they can be put through the sifting-machine also, then you have about the best material for raising plants and starting seeds that can well be compounded. Now, I had begun to think that I was the pioneer in this matter of having a suitable machine for sifting dirt; but our friend E. E. Wolf, of Springfield, O., it seems, has been working right along in this line. He has invented a machine, and put it on the market, a cut of which we give below. Permit me to say, before I describe it, that we found we could not get manure or rotted turf to go through our sifting-machine without rubbing it through with the back of a rake or something of that sort. The machine shown below anticipates this need.



WOLF'S MACHINE FOR SIFTING COMPOST FOR GARDENERS AND FLORISTS.

The machine stands very solid and secure on four feet of stout hard wood. The sieve is made, as you will see, so as to rock or swing; and then there is a series of blunt rake-teeth—see letter B in the picture—and these rake-teeth rub back and forth on the sieve A. A series of coiled springs, E, make these blunt teeth rub just hard enough on the heavy galvanized-wire screen. The operator takes hold around the wooden bar at A, and pushes the sieve back and forth, the teeth B being fastened on the stationary part E C. While one man works the screen back and forth, one or even two other men are needed to shovel the compost into the hopper C. The action of the teeth is such that sods, coarse manure, and every thing of that nature, are pulverized and worked through the screen. Where the compost is in proper condition, the inventor says it keeps two men busy to shovel it into the hopper C. To prevent the accumulation from getting in the way under the machine, the apparatus should be set upon a platform, or, better still, over a hole in the floor, so as to let the pulverized potting soil, or whatever you may choose to call it, fall into the cellar beneath. We have had a machine here on trial, and it does excellent work; but it seemed to be rather better adapted to the needs of florists than to the average market-gardener. For our use, on our quarter-acre of plant-beds, something like the machine shown in the tomato book seems to be handiest. The price of the above machine is, I believe, about $25.00.

THAT PIECE OF RYE—SEE PAGE 612.

Yesterday, July 24, we thrashed, and I was considerably disappointed (!) in getting 140 bushels of exceedingly nice rye when I had planned to get but about 100. As there were only three acres, and it was here and there in little patches, most of it, you may be sure I felt as if I had done pretty well for a one-horse farmer. You see, that is almost 50 bushels per acre; and if I had done the raking-up myself I feel quite sure that I could have made it quite fifty to the acre. We were obliged to borrow a horse-rake to follow after the harvesters; and before I knew it my man had finished and taken the rake home. Every time I go over the field it makes me feel bad to see the great plump heads of grain scattered right and left, and almost all through the rye stubble. We put in rye the last thing after taking off our

crops; and I fully believe, with Terry, that it is much better for the ground to have some growing plant on it every month in the year. Just think of seeing rye and clover looking bright and green every time we have a warm rain in fall, winter, and spring! If I could get any thing like the old price for my rye I do not know but it would pay almost as well as some of my garden crops.

Hold on! there is something more in regard to this rye business. A part of it was on a piece of ground where I plowed under red raspberries after ripening their crop, say just about one year ago. After the raspberries were burned under we put on buckwheat and got at the rate of 40 bushels per acre, as I have told you. Now, inside of a year two crops of grain have been grown on this ground—one crop of 40 bushels per acre, and a crop of rye of about 17 bushels per acre. Did I use any phosphate? Not a particle; but I did put on some bonedust with the buckwheat, and some more with the rye—about 200 lbs. to the acre; but, more than that, I put on at the rate of perhaps 25 loads of manure to the acre, that came from a neighbor's barn near by. It had been piled up against the barn so that it was rotting out the sills and the weather-boarding of the barn, and he finally let me have it for a dollar a load. Mrs. Root feared that I was putting more dollars on that poor piece of ground than the crop would bring. The buckwheat has been sold for about $1.00 a bushel, and the rye will bring perhaps 75 cts. a bushel. It is very fine and plump, and we shall sell the greater part of it for seed.

SOMETHING VALUABLE FROM OUR OHIO EXPERIMENT STATION.

Friend Root:—The question asked by J. W. Nicodemus, about how much hot-bed a ten-horse-power engine would heat, I may be able to help a little. Last winter we used such an engine for underground heating in our greenhouse, which was very much like a hot-bed. The amount of space we heated was 13 feet wide and about 85 feet long. This would amount to over 10 rods of six-foot hot-bed. In heating the amount of bed that we did, I do not think we used over one-fourth of the steam that was made by the boiler, the rest being used for heating other parts of the houses. So your estimate of a ten-horse boiler heating a quarter of an acre is not far out of the way. The difficulty we found was, that the steam went into the ground at too high a pressure, and would burn the plants; so, in getting all there is in such a boiler there is some danger where the steam is first let into the pipe. A larger boiler at a lower pressure would be better. The lettuce-plants that we grew over this underground heat did far better than they would without it, and so did the lettuce rot, which at one time threatened to spoil the crop. But I think that, for hot-beds during the spring months, it will be a good thing.

MUSHROOM SPAWN THAT DON'T GROW—WHO IS TO BLAME?

In the matter of poor mushroom spawn, Johnson & Stokes are not alone. We bought our spawn of A. W. Livingston & Sons, of Columbus, and it was poor. The reason I know this is because spawn obtained from Henderson, planted at the same time and under the same conditions, produced a fairly good crop. I do not think it best to blame the seedsman too much for such things; but where it can be proven that they have sent out poor stock they should be willing to do something to make it right, for their loss would not be so great as the planter's. I would give as much to be able to tell good spawn, or for some way to test it in a reasonable amount of time, as I would the vitality of seeds. Can any of the readers of GLEANINGS tell us how? E. C. GREEN.

Wooster, Ohio, July 14.

HEATING HOT-BEDS BY STEAM; A HOME-MADE ARRANGEMENT.

I notice on page 536, July 1, inquiry is made about a boiler to heat hot-beds. I have been having some thoughts on that line myself, and have been thinking why a large sap-evaporator could not be covered tight with matched boards, like your kettle for making steam for melting wax, and produce a large amount of steam in a cheap way. I suppose the evaporator could be fixed in some way to indicate the stage of water in it, so as not to run dry. I should also like to ask you how deep you would lay tile in an asparagus-bed to put steam through. G. W. LAWSON.

Centerville, O., July 10.

[Yes, friend L., you could cover any sort of large kettle, or even a maple-sap evaporator, with wood so as to generate steam with sufficient pressure to warm hot-beds; and if the man who makes and owns the machine were to run it himself, and not let anybody else touch it, I think he might get excellent results from it; but let the hired man take hold of it, and if the steam be confined at all, he would be likely to have a blow-up, or, at least, have the top blown off. If he failed in that he would boil all the water out; and, therefore, all things considered, I think a second-hand steam-boiler would be cheaper in the end; besides, it would be much greater economy in point of fuel, *besides* being much more convenient. Where one has a large kettle, however, and has not the money to buy a boiler, I think he might heat his beds very well. A very little steam gives all the heat required, and almost no pressure at all is just as good as or better than an ordinary boiler pressure. As asparagus goes down pretty deep I think I would have the tile 2 or 2½ feet below the surface of the bed. Asparagus, rhubarb, and all such rank growers, respond very quickly and readily to any gentle steam heat.]

A STRAWBERRY REPORT, ETC.

I am now out of the bee-business entirely, and have continued GLEANINGS only for the strawberry talk. Please give us all you can of it. I am now a full-fledged strawberry-crank, for which Mr. Terry and A. I. Root are mainly responsible. I must tell you about my Gandys. One acre, 175 bushels, ⅞ assorted fancy, brought me $4.00 per bushel straight; ⅛, seconds, brought 10 cts. per quart. I picked 54 bushels one day, which sold for $200.00 Ordinary berries have no show when the Gandys come. They were sold in the city of Jackson, 18 miles distant. All went by wagon. They had never seen such berries, nor I either. The Haverlands are the heaviest bearer, and are a good selling berry; also the Warfield, which were as large again as the Wilson, and the best canner on the list. The Bubach is extra large and fine this season. The Parker Earle did well. The Michals were fine, and yielded quite well. I have quite a number of new varieties, including the Timbrell, of which I bought 50. I left one plant to fruit, and they have certainly a fine flavor, and exceedingly firm. Where can I get a good barometer, such as you sold a year or two ago?

Leslie, Mich., July 17. C. N. FLANSBURG.

[Well, friend F., if your success was in consequence of reading the strawberry book, I

think it was truly a good investment. As there was not very much demand for the barometers, we took them out of our price list; but we can still furnish them at $2.50; 10 cts. extra if sent by mail. And, by the way, I can not understand how it is that so few barometers are used by farmers and market-gardeners. Our own saves us several times the cost of it, over and over, in a single day. I told you a year ago about getting my rye harvested without having a drop of rain touch it; and, again, how we put all hands to drawing it in and stacking it so as just to escape a heavy rain. Well, we did the same thing again this year. When the rye was just right to draw in, the barometer began falling rapidly. By putting all hands at work it was nicely stacked, topped out, and perfectly protected just as the big drops began to fall. A good many would say this is luck. It was not luck at all; it was watching the barometer, and laying our plans accordingly. A few days ago a neighbor ordered a lot of cabbage-plants taken up, just as it began raining. The clouds and the wind certainly looked as if there was going to be a big rain; but the barometer was running up rapidly. I told my neighbor we should be very glad to sell him the plants, but that he certainly would have to carry water to save them if they were set out at such a time. He finally stopped having the boys take them up, and it turned out just as I told him it probably would. When Ernest and I were out riding our wheels we made inquiries in several small towns for a barometer; but nobody knew of such a thing anywhere around. Now, I do not say this because I want to sell these instruments. If you propose to buy a barometer, and then pay little or no attention to it, you had better not have one. You must get *acquainted* with it if you wish to have it be a real help. I am glad to hear your good report of the Timbrell strawberry.

ANOTHER STRAWBERRY REPORT.

My bees are just booming this summer, and are piling in the honey almost faster than we have time to take it out, and must therefore still have more goods in order to keep things going. I am a market-gardener and a bee-keeper, and sell my fruit and vegetables to the consumer, peddling them out from house to house to regular customers over town, and thus dispose of my honey the same way at the same time. Prices for fruit (berries), vegetables, and honey have been very satisfactory this summer thus far, being a good demand for almost every thing. I tell you the Bubach No. 5 and the Haverland are regular dandies in the strawberry line, and the Lloyd's Favorite among the raspberries. Well, I dare not let myself in any further just now, for I am in too big a hurry.

MARTIN D. WENGER.

Elkhart, Ind., July 18.

EXPERIENCE WITH BUCKWHEAT.

The following is clipped from the *Practical Farmer*. It may be a little late in many localities; but we have had excellent success here with buckwheat sown even after the first of August. The particular point in the following is, that buckwheat may be used to bring up land, and still give profitable crops. Another thing, it shows how two full crops, even of farm products, may be obtained in a season.

I have best success with buckwheat in regular rotation, buckwheat, oats, and clover, three-year rotation, mowing only one year. If left longer, the clover kills out, and the growth is not so large to plow under. Eight years ago I had a ten-acre field that would hardly raise white beans. I thought that a three-year rotation, as stated above, would bring it up to a good state of fertility, and started in with the experiment. Sowed to oats, and seeded to clover in 1885. The season being favorable, a good catch of clover was obtained, and about 15 bushels of oats per acre. The latter part of June following I plowed the clover under, about 1½ tons per acre, and sowed to buckwheat, harvesting about 18 bushels per acre. The following season I harvested 30 bushels of oats per acre, with a fine catch of clover. Season of 1888 I harvested about 2½ tons of clover per acre. Season of 1889, I harvested 30 bushels of buckwheat per acre. Season of 1890 I harvested 40 bushels of oats per acre, though a very unfavorable season for oats, many fields being plowed up for buckwheat, the grass-catch this season being a perfect mat. Last season I harvested 50 bushels buckwheat per acre, and the land is now sufficiently fertile to raise any kind of crop. This rotation gives two full crops in one season, and, by giving the soil the benefit of the first, you improve the soil much more than the second one exhausts it, and still have the most profitable crop of the three rotations left. I consider it the most profitable grain crop I raise; always ready sale immediately after harvest, for cash, at a fair price. For good, rich, dry soil, I think the Japanese variety does best, but needs to be sown much thicker, as it does not branch so much. The later it can be sown and ripened before frost, the larger the crop. Next to the Japanese I would sow the American Gray. I never had any luck with the silverhull.

Granville Summit, Pa. M. M. LUTHER.

A GOOD WORD FOR COMMERCIAL FERTILIZERS, ETC.

Bees are doing very well, bringing in the finest honey I have ever had. I will say, also, that I tried commercial fertilizers this year—the first we ever used. On squashes there is a marked difference in favor of the fertilizers. I have 4500 celery set the new way, and think the fertilizer is a great help on them. I should be glad at any time to have you visit us. We are near the station, our land running up to it.

Fairlawn, O., July 18. CHAS. W. FRANK.

For he doth not afflict willingly, nor grieve the children of men.—LAM. 3:33.

THE Hon. Eugene Secor, of Forest City, Ia., we notice by the *American Bee Journal*, has been appointed judge of the apiarian exhibits at the World's Fair. Mr. S. is a "fair" man, and we feel sure that all the exhibitors will be pleased with his appointment.

BRO. ALLEY has found one "stray testimonial" favoring the Punics, and desires us to take notice. Having read a very large number that were decidedly unfavorable, we too have been of late watching for a "stray testimonial" that was favorable, but without success. Friend Alley is to be congratulated.

THE *Colorado Magazine* is the name of a new illustrated periodical that compares, in the character of its articles and its illustrations, very favorably with the *Century*. Why we speak of it is because a prominent writer for the *American Bee Journal*, Will M. Barnum, is its assistant editor.

THE Langdon non-swarming arrangement, according to the *Bee-keepers' Review*, and a few scattering reports that we have had in our own mails, so far is not proving to be the success that was expected of it earlier in the sea-

son. Indeed, the bees in some cases seem to be *more* inclined to swarm with the attachments than before. The double dose of bees suddenly poured into one colony sets them wild, and they swarm anyhow. But perhaps—at least we hope so—later reports will justify our earlier expectations.

THE *Amateur Bee-keeper*, by J. W. Rouse, is the name of a sprightly little work intended especially for beginners. It has been issued from the press for some time, but it has been only recently that a copy came into our possession. It seems to be correct in method, and reliable and orthodox in its teachings. It covers the whole range of practical apiculture, and yet is sufficiently full so as not to be misleading. It is published by the Leahy Manufacturing Co., Higginnsville, Mo. It can be obtained of the publishers, or of us. Price by mail, 25 cts.

REFERRING to the Weed artificial comb, Mr. E. E. Hasty says, in the *Bee-keepers' Review:*

GLEANINGS pleads not guilty about the Weed comb. It looks like a bad case of blundering on my part. I must investigate dates a little (when bees are not swarming); and if the description was promptly given, before people had largely learned the thing from other sources, I will eat "humble pie" as if I liked it. Humble pie is good for hasty folks any way, but it doesn't taste good.

We are all liable to err, and we will not lay up any score against our friend, especially when he acknowledges his error so gracefully. Would that more "hasty folks" were of that kind!

IN our last issue we reported that the *Canadian Bee Journal* office was destroyed by fire. We have since learned, with regret, that the entire plant of the Beeton Publishing Co., of which the *Canadian Bee Journal* and *Canadian Poultry Journal* were a part, was burned. The loss is estimated at $5000.

Later.—Since writing the above we are pleased to announce that the Goold, Shapley & Muir Co., Limited, have purchased the *Canadian Bee Journal*, and that R. F. Holtermann is to be editor and manager. We are informed that the journal will be "issued monthly, enlarged, and the appearance as well as the material will be considerably improved." We extend our hearty good will to the new owners.

ALTHOUGH it is now the 26th of July, honey seems to be still coming, although the flow is perceptibly easing up, as is evidenced by the few robbers now poking around the exposed tops of hives while being manipulated. The reports for the North are still good, and so far we have received only three adverse ones—two from Illinois and one from Missouri. There is no doubt now but that 1893 will go on record as the "great clover year," or, as we sincerely hope, the beginning of a series of good years. Basswood has yielded fairly in some localities; but with most bee-keepers it is the "off year." The reports from the South do not show any thing out of the ordinary; in fact, on account of dry weather the season has been rather poor.

IT would seem from Rambler's article, elsewhere, that the big stories about large crops of honey have a tendency to reduce the prices of honey in California. This is no doubt true everywhere. Perhaps the encouraging reports that we have been inserting elsewhere, together with our editorial notices of late, showing that 1893 is a phenomenal honey year, will have a depressing effect on prices. We hope not, because this year there will be very little encouragement to glucose-mixers; and because of this when extracted honey seems to be scarce, the price does not go up according to usual law of supply and demand; and when honey *is* plentiful, the price remains largely the same. We may expect a slight reduction in prices, but the large yield will more than offset that. It is the very small yields of from five to ten pounds per colony that dishearten almost any bee-keeper, no matter what the price is. The very fine quality of honey this year will tend greatly to keep prices up.

BULLETIN No. 96 from the Michigan Agricultural Station, entitled "Honey Analysis," by Prof. Cook, has been received. It treats of the recent developments on the subject as gleaned by Prof. Cook, and which were introduced by him some months ago in our columns. The conclusions arrived at are essentially the same as there stated; viz., that chemists can easily detect adulterations of honey with glucose or cane sugar; that honey-dew honey can probably be distinguished from glucosed honey; that chemists can not distinguish between sugar-syrup honey and honey from flowers. Regarding this last proposition, we have to say we received a letter recently from Prof. Wiley, to the effect that chemists do make the distinction. Whether the knowledge of the method by which it is done was obtained after the preparation of this bulletin, we can not say. The bulletin is sent out for free distribution to residents of Michigan by applying to the Secretary of the Agricultural College.

THE QUALITIES THAT SHOULD GO TO MAKE UP A GOOD EXPERIMENTER.

THE Michigan Experiment Apiary is booming, and there is promise that the bee-keepers not only of Michigan, but of other States as well, will gather much of value from the experiments reported in the *Bee-keepers' Review*. Brother Hutchinson has a good article on experimental apiculture in his last issue. There is one paragraph that we wish especially to indorse, and it reads as follows:

It is not every bee-keeper who is "cut out" for an experimenter. It needs a person of a judicial cast of mind—one who is perfectly willing, so to speak, that an experiment shall prove the truth. Too many of us are inclined to make a decision *first*, and then go to work and try to prove what we already believe. This will not answer. An experimenter ought to be wholly disinterested in the results—that is, be willing that an experiment should prove either side of the question.

Too many experimenters, much to the disgust of the careful and conscientious observer, and to the very great hindrance of real progress, figure out in advance just how a certain thing *ought* to work. Yes, they will twist their experiments and then look at the results cross-eyed. Now, we should expect and desire to see in the candid experimenter one whose previous conclusions would be sometimes modified. Such a one who has never had occasion to change his mind after a series of experiments, we should consider not altogether a reliable guide; for no one has ever yet been able to form correct conclusions before he has tried. Yes, indeed, too many experiments turn out just as the experimenters want them to. From what we know of our friend Mr. Taylor, of the Michigan Experiment Station, we should not expect any thing of this kind in him.

DO SWARMS UNITE WITHOUT A QUEEN?

THE editor of the *Review* made a visit to the Michigan Experiment Apiary. He finds that the apiarist, Mr. Taylor, will devote more or less of the whole 300 colonies to experimental work. After speaking of the pleasant location

of the apiary, and the slope of the grounds, etc., Mr. Hutchinson says:

From eight o'clock in the morning until half-past one in the afternoon (when I left for home) there was scarcely a moment when there was not a swarm in the air, and sometimes two or three. There were queen-traps on almost all the hives. As two or more swarms would unite and then go piling into one hive, perhaps one from which a swarm had not issued, Mr. Taylor would remark with a smile, "I wonder what Mr. So and So" (mentioning some man who had said that bees always go back to their own hives when the queen is not with them) "would say if he were here now."

We suspect that "Mr. So and So" means *us;* at any rate, we will assume that it does. We did not say that bees would "*always* go back to their own hive" when the queen was not with them; but we did say, on page 275, that swarms in the air, without queens, were "not nearly so apt to unite." We have just been down to ask our neighbor, Mr. Burt, his experience in this line. He clips all his queens; and although he has a good many swarms he tells us that it is very seldom that he finds that two swarms in the air will unite. In the great majority of cases, each swarm will go back to its own hive. But then, friend Taylor, you know bees have a way of doing things differently for different bee-keepers.

Later. — Since writing the above we ran across one of Dr. Miller's straws (this issue) wherein he says his bees "are worse than usual about uniting and going back to the wrong hive when they swarm without a queen." We suppose friend Taylor will smile broader than ever when he reads that straw. Nevertheless, Mr. So and So doesn't give up yet but that swarms without a queen are *more apt* to go back to the old location.

ANOTHER WHEELING-TOUR AMONG BEE-KEEPERS; A VISIT AT H. R. BOARDMAN'S.

A few days ago a small party of wheelmen invited your humble servant to accompany them to Norwalk, a town some 43 miles west of Medina. In the company was a cousin of ours, Miss Gray, the only lady. Some fears were entertained as to whether she would be able to stand the trip; but we agreed to let her set the pace, and accordingly she rode ahead, taking such a pace as would be to her perfectly easy. When we reached Litchfield, 10 miles away, we found we had taken just one hour. Wellington, 10 miles further on, we reached in the same time; and still our lady pace-maker, instead of being fatigued, was jubilant with spirits, and eager to go on. However, we stopped at the hotel for a half or three-quarters of an hour. After resuming the journey the next point we reached was Norwalk, 23 miles further on, over roads less easy of travel. With Miss Gray as pace-maker we made the time in two hours and a half, making the whole journey of 43 miles in four hours and a half. Our pace-maker was somewhat tired; but after dinner she seemed to be as fresh as ever, and ready to finish her journey to Sandusky, making a total of 70 miles. At Norwalk we left the party to make our way back home, intending on the way to visit, perhaps a little out of our road, Mr. H. R. Boardman, a bee-keeper who needs no introduction to the readers of Gleanings. Reaching his apiary at East Townsend we found that the bees were still working strongly on clover and basswood, and the merry hum of thousands of workers was delightful indeed, for so late as July 21. We looked about the apiary and saw no one. Finally we discovered one of the helpers crating up honey in the honey-house. We feared that Mr. Boardman might be away—possibly at an out-apiary; but as fortune has usually favored us on these bicycle-tours, we were told by the young man that he was in the house. A knock at the door brought the response, "Come in!" A moment more found us in the presence of our East Townsend bee-keeper apparently sending out bills for honey shipped. We had given him no intimation of our visit; and after he had recovered from his surprise we began to talk bees at once. We arrived there about 3 o'clock, and told our friend that we could not remain long, as we wished to get home that night, and there were some 40 miles ahead of us. As usual, we found our friend full of bee-talk. About the first question we asked was, as to

WHAT HAD BEEN THE HONEY-FLOW.

"In some respects it has been remarkable," said our friend. "My honey is not all off yet; but one of my men estimates that my crop of comb honey will be somewhere about 10,000 lbs., from one apiary of less than 175, spring count."

"But you have more than one yard, haven't you?"

"Only the one. I had some forty colonies last fall in an out-apiary, that I did not feel disposed to put any more expense upon, and just left them out of doors, to take their chances, with the result that they nearly all died; and what lived were too weak to be of any use. But," said he, "I lost none at the respository here at home, wintered on my plan."

"Then," said we, "your loss was not due to any fault of your method, but to lack of attention."

"That is just it."

As our time was limited we changed the conversation pretty often. We next asked our host if he could explain why clover had begun to yield in the good old-fashioned way this year, and had failed to do so for the past four or five years.

"I don't know any thing about it," he answered.

We then suggested the theory that all sorts of crops have their cycles of four or five years of yielding well, and also their cycles of yielding little or nothing.

"That is one of things that I 'don't know,' in the language of Dr. Miller," said our friend. "But I know," he continued, "that all kinds of clovers have been yielding remarkably this season. Sweet clover seems to be doing more than usual."

"Yes," we remarked, "as we came along it seemed to skirt the roadsides almost our entire journey, and we observed that it was thickly covered with bees. But how do you account for the fact that these sweet clovers seem to select the roadsides for so many miles? Down in Medina they say, in spite of our protests, that A. I. Root goes out nights scattering sweet-clover seed along the roadsides."

"Yes," said Mr. Boardman, "they are accusing me of a similar thing. The fact is, the seeds drop down by the roadside, and during muddy weather they are picked up by wagon-wheels and extended over miles of road."

"There, there! you have given us a new idea," we exclaimed. "We have tried before to convince our Medina farmers that we did not scatter the seeds; but here we have the real explanation."

"Yes," said Mr. Boardman, "within the last few years sweet clovers have taken a wonderful growth throughout the country. We never used to see them."

Again we changed the subject, for we desired to pump our friend as much as we could before we left.

"Do you still cut out combs from the brood-nest of your side-opening hive?"

"I do," he replied, "but I am using more

built-out combs than formerly. I find that the bees are more apt to build drone comb during the swarming season; but after that time they are quite inclined to build nothing but worker comb; hence, early in the honey-flow I give drawn-out combs; and, later on, frames with only starters of combs."

It will be remembered that Mr. Boardman has a side-opening hive, and his practice in the past has been to cut out combs in the brood-nest from those that did not have brood in, compelling the bees to carry their surplus up into boxes for the want of storage room below. These combs that contain honey are extracted, and are rendered in the large Boardman solar wax-extractor.

Once more we changed the subject.

"What about the Langdon non-swarmer? have you tried it?"

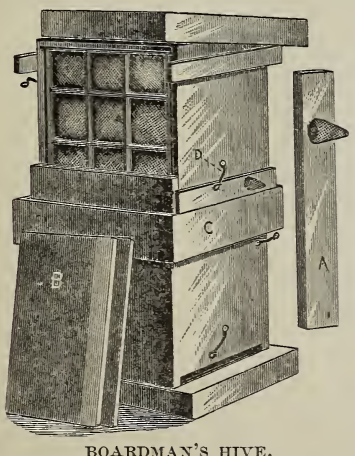
"I have not; and I do not know that, for my purpose, I want to. I desire bees to swarm. Just come with me."

We took our hats and started for the apiary.

"There is a colony," said he, pointing to one, "that was bringing in, by the scales, from four to five pounds of honey daily. The new swarm, after being hived, brought in over double that amount daily. Besides that, the old colony was doing something, and that is about the case with more of them. Yes," he added, by way of emphasis, "I *want* my bees to swarm."

We do not remember exactly, but we think he said that, for him, the parent colony and the swarm would gather considerably more honey than any colony would gather with the same force of bees, with the swarming impulse taken away, *if* such could be done.

As we passed along, Mr. Boardman, pointing to a number of hives in which there were cone bee-escapes at the entrances of the upper story, said, "There is the best bee-escape out. I just simply attach one of these escapes, fastened to a thin strip of board 2 inches wide, and the width of the entrance. There," said he, "by turning this wire button over it, you see it can be attached and detached in an instant. When a super is full I put this on at night, and the next morning the bees will be all out, with the possible exception of two or three."



BOARDMAN'S HIVE.

The bees, instead of going through the bee-escape into the brood-nest direct, come out into the open air and go down to the entrance below, with which they are familar. As our readers may have forgotten what the Boardman hive looks like, we reproduce a cut which was shown some time ago in GLEANINGS. The bee-escape is shown in position. It was friend Boardman, we believe, who gave the first published account of the successful working of the cone bee-escape. But the matter seems to have been dropped at the time, and no particular prominence was given to it until about a year later, when our enterprising friend J. S. Reese introduced it to the bee-keeping world.

As we walked through the apiary, Mr. Boardman called our attention to his bee-feeder. We pronounced it the best entrance feeder we had ever seen, and requested him, when he had time, to write up a description of it for GLEANINGS.

"Did you notice," said Mr. Boardman, "that the grass is all kept down in the bee-yard."

"Yes, we did notice it."

"The weeds were shaved down," he continued, "only once this spring, and you see how clean the ground is now."

We continued walking through the yard until we came before three of the mammoth Boardman solar wax-extractors. These are kept constantly going, and Mr. Boardman is constantly accumulating some nice beautiful wax of first quality; for you know he cuts combs out of the brood-nest to force the bees into the supers; and these combs must be disposed of. You will remember, some time ago we raised the question as to whether or not the solar wax-extractor rendered all the wax out of the cocoons. We challenged our friend to send us 25 lbs. of slumgum, or refuse, saying that we thought we could show that there was still wax in it. We did show the presence of wax, and that was all. We secured, after a great deal of labor, by the use of sulphuric acid, wax-press, etc., a few ounces. The test proved that Mr. Boardman secures practically all the wax there is in the old combs, and that the only reason why this slumgum makes such a fire is, that the propolis, melting at a higher temperature than is reached by solar wax-extractors, remains in the slumgum. We were pleased to notice that Mr. Boardman uses the extractors, not only for rendering out combs, but for drying out fruit, corn, etc. By the use of ventilators near the top he lets the moisture escape as the fruit dries.

As we looked at the bottom of the extractors, we asked him what it was that prevented the boards from shrinking and letting the wax run through the cracks.

"I had some little trouble in that direction, and an old carpenter told me that butternut was the least liable of any wood to shrink or swell. After using that kind of wood I had but little trouble."

We will explain to our readers, that the Boardman solar wax-extractors have, for the bottom, only matched boards, and, of course, it is desirable that the stuff be put together as tight as possible.

We intimated several times that we should have to get on our wheel, because we had to be at home that night. It was very hard to break off in the midst of so many interesting topics. We finally told our friend that we hoped we could call upon him again this same season, and take a little more time. We mounted the wheel at 4:20, having stopped an hour and 20 minutes. At 10 minutes of 6 we were in Wellington, some 20 miles distant. We did not stop to talk long, but sped over to a restaurant for a lunch, and at 6:6 we were on our way again. At exactly 7:45, standard time, we were in front of our own door, the last 20 miles being made in 1 hour and 39 minutes. Our entire run that day was 90 miles; and so perfect are the wheels nowadays that we felt little or no fatigue. Indeed, we felt as if we should like to go another 20 miles.

Perhaps some of you will not believe this—

that is, those of you who have never ridden wheels. But such feats are of rather common occurrence now, and we mention them only to show that the bicycle is a rapid and practical means of conveyance to points within 100 miles. Indeed, we could not have taken a train and visited the various points we did, because the trains seldom or never go so as to start and stop whenever we want them to; and while the ordinary passenger trains make much faster time when traveling, we often have to wait several hours before we can take them, and, of course, valuable time is lost; but the ever ready wheel stands at our bidding.

JOHN CHINAMAN, AND THE "PICTER" ON PAGE 571.

If it hadn't been for the aforesaid picture, I think I might have forgotten to say any thing about how John carries tremendous loads by means of his pole. Near Los Angeles I went out to visit the Chinese gardens. The rows of cabbages were so long that Mrs. Root got tired, so I wandered off by myself. The Chinamen were not very communicative in this garden, but I managed to get a few answers to my questions. One of them was gathering cauliflower. He had two baskets, each one of which would make a pretty fair half of a one-horse wagonload. He filled these brimming full, and then adjusted his pole; and after he had got his load vibrating just right he skipped along, making the vibrations keep time to his steps, and moved his immense burden with astonishing ease and celerity. I don't suppose a Yankee could ever learn to carry a burden in that way, and I am afraid he would never learn to carry as much, and as safely and quickly, as a Chinaman, even if he could. In Portland, Oregon, a Chinaman had a job of carrying firewood upstairs. He did it with a couple of baskets and a pole; and the way he trotted upstairs, without bumping a basket, with more wood than an Irishman could have carried on a wheelbarrow, was a wonder. Somebody told me that they could not carry these large loads if it were not for those peculiar vibrations. It probably works something like the sprocket-wheel on the modern Columbia bicycle. No matter; if you haven't seen a Chinaman carry a small wagonload on a pole, just watch him the next time you have an opportunity. Now, Rambler may succeed in swinging his pole of honey Chinaman fashion; and he may possibly get some wooden shoes and a starched skirt coming down a little below his regular coat; but I don't believe he will ever be able to carry any such load as they do. I have several times wondered why it was that the rest of the world did not learn how to carry heavy burdens as the Chinese do.

TRADE NOTES.

A SURE WAY OF PREVENTING SPARKS FROM HOT-BLAST SMOKERS.

A few days ago we were favored with a visit from Dan White, that bright and enterprising bee-keeper of New London, O. Like all the rest, he has experienced a phenomenal honey-flow; but like the rest, too, he had let a portion of his bees die during the past winter, because, the last four or five years, it had not paid him to keep them. He now says that, if he had given those that died about $50.00 worth of sugar, he would have received in return over $300 worth of honey.

He was greatly pleased with the principle of the Cowan extractor and the new Crane smoker. He has always used the Bingham, and likes it. While we were discussing smokers he mentioned, incidentally, that he had got rid of the spark nuisance by inserting in the nozzle a piece of common window-screen wire cloth, about 3½ inches square. "But," said we, "doesn't this fill up and cause trouble?" "Once in a great while," said he; "but it is so little trouble to get hold of one corner and pull it out, and give a few raps on the bench, and replace it, that I would never think of going without the wire cloth again, because it prevents the throwing of the sparks from the smoker-nozzle absolutely."

We considered the idea so valuable, cheap, and effective, that we have decided to insert it hereafter in all the Crane nozzles; and we feel quite sure that Bro. Bingham will favor his trade in a similar way. All bee-keepers now owning Crane or Bingham smokers, or, in fact, any smokers with detachable nozzles of the hot-blast type, will find it a decided advantage to put the wire in now; and then when their smoker gets nearly empty they will have no trouble from sparks.

THE LANGDON NON-SWARMER; A REPORT OF HOW IT IS WORKING THIS YEAR WITH THE INVENTOR.

On page 576 we asked for reports as to how the Langdon non-swarming device was working this summer; and among others a report from the inventor himself. He has kindly responded as follows:

Mr. Root:—In regard to the non swarmers, I am obliged to say that, for some reason, they have not done quite so well as they did last season with me. Also, I have had a few reports of failures by those using them. One neighbor makes his go all right, and is getting a lot of honey from the two hives. Another had three swarms from ten devices in use. Eugene Secor writes that his did not work right; also Mr. Gemmill, in Ontario. A few others are all I have heard from.

How much the difference in mine depends on the season is hard to tell. There has been some swarming—a small per cent—from the 60 non-swarmers in operation on my house, and I find, from my experience this year, and from the few reports I have received from those using them, that there are three points that it will not affect; viz., occasionally a queen is killed, and hatching cells make trouble afterward. If the queen is old, and the bees try to supersede her, they will build cells in the closed hive; and then if it is opened soon after, she might lead out a swarm. This can be stopped by keeping all queens in their prime as every bee-keeper should do.

Again, it is known that they will sometimes swarm in the ordinary way with only eggs in the queen-cells that they leave. Running so many bees into the same hive seems to encourage this extreme of the swarming fever; and it has been done more frequently with the non-swarmer in place than before. To what extent shading the hive would help this, is yet to be seen. Also, there might be a great difference of bees as to that point. I have only Carniolans, and so do not know what Italians would do under the same circumstances.

These are exceptions; but they may stand in the way of having the plan largely adopted. I can make it of important use to myself in combination with my house-apiary, *even as it is now*, because, with the loss I have had, I am ahead in the saving of work. They were put in operation and on the market late, and I think that will account for the failure of some. But I made one mistake in my circular, in instructing them to make the change of bees and cases from one hive to the other once in seven days instead of not over five.

A natural queen-cell hatches in nine days; so if the bees have the swarming fever very badly, and start a cell from a larva just hatched from the egg, or one day older, they can seal it and swarm on the fifth or sixth day from the time they are turned into the other hive *if they start it the same day.*

I think this is where the most of the failures lie; and that, by a careful working-up of these points, under the different conditions found in the various